

NEWS

AT&T unleashes 'Gazelle'

By John Hsi
CW Staff

NEW YORK—AT&T Information Systems, Inc. brought out its second digital voice/data private branch exchange (PBX) here late last week, a mid-range system that is compatible with, but has a different architecture than, its larger System 85.

The System 76, whose existence under the code name Gazelle had been long rumored, supports a maximum of 400 stations, 800 data and points and 300 trunks in any combination, according to Alec Peiner, executive director of AT&T Information Systems Laboratories' Integrated Systems Division.

Analysts said that the new switch will compete primarily with products from Rolm Corp. and Northern Telecom, Inc.—vendors that have, ironically, benefited from AT&T's late entry into the market for switches of this size.

"Rolm, Northern Telecom and other switch manufacturers have become established enough as plausible suppliers that AT&T is going to have a harder time getting into this market with this new switch than it would have two or three years ago," noted Thomas R. Elliott, director of research at International Data Corp., a Framingham, Mass., consulting and research firm.

The System 76 ranges in price from \$600 to \$800 per line, depending on the number of lines and the variety of telephones used. As with any digital PBX, the more standard analog end configuration would be just over \$300 lines.

While the System 76 is said to be able to support 400 lines, Peiner said that, in application, a more likely high-end configuration would be just over 300 lines.

The new system, which has a dual,

8-bit parallel time division bus architecture, has a standard wiring scheme identical to that of the System 85. This includes the installation of four wire pairs for each station, only two of which are used to support digital voice at the handset and/or provide an RS-232C interface for a terminal device. Standard analog telephones require only a single pair of wires.

All of the telephone instruments supported by the System 85 are also supported by the smaller switch, including the 7000 series telephones that AT&T calls "terminals," which were introduced with the System 85.

Data terminal equipment can be connected to the System 76 through 7000 series telephones outfitted with the required data module or through stand-alone data modules. As released, the switch supports 19.2K bit/sec asynchronous data communications. A higher speed 64K bit/sec capability can, for now, only be tapped when using AT&T's 815 Business Communications Terminal, a device that incorporates a digital telephone with a display terminal.

Under AT&T's Distributed Communications System and Information System Architecture, the System 76 can be integrated into networks of other System 76s, System 85s and other Dimension 7003, Peiner said. At this point, however, the new switch cannot serve as a tandem point within a network, but can be incorporated as an end point where it is directly connected with only one other switch.

The System 76 will be available on a limited basis in the third quarter. General availability is slated for the fourth quarter.

AT&T Information Systems is based at 100 Southgate Pkwy., Morristown, N.J. 07960.

AT&T, BOCs overreached: ICA

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C.—The International Communications Association (ICA), which represents the largest business communications users in the U.S., has claimed that access charge rates filed by the divested Bell operating companies and the long-distance tariffs filed by AT&T are overrated by \$3 billion to \$4 billion.

Comparing the cost predictions made last year by AT&T and the divested Bell operating companies with their just-reported earnings for the first quarter of 1984, the ICA said the figures show the projected costs were overrated. The association's complaints were made in an appeal it filed April 19 requesting that the Federal Communications Commission prescribe just and reasonable access charges reflecting the allegedly overstated "\$3 [billion] to \$4 billion in the costs (revenue equipment) that will underlie the access service and AT&T interstate rate levels scheduled to become effective in 1984."

The ICA charged that the divested Bell operating companies' effort to have the FCC expedite approval of their exchange access charge tariffs

last month was done to forestall the recent FCC move to open an inquiry into the reasonableness of the industry 12.75% rate of return. Subsequently, the divested operating companies reported generally favorable first-quarter earnings that exceeded their own projections.

Large-cost review

The FCC is in the midst of a large-scale review of the access tariffs, which have been revised for the second time by the divested operating companies at the insistence of the FCC. The tariffs are planned to go into effect on or before June 15.

ICA concluded that its analysis of the overstated costs submitted to the FCC "convincedly documents that about \$3 [billion] to \$4 billion in excessive exchange carrier and AT&T revenue requirements could be eliminated from the underlying access and AT&T tariff cost support, thereby paving the way for immediate and meaningful, rather than token, reduction in all access and AT&T service rate levels." The association said this reduction could be as much as 10% to 15% in access rates and perhaps comparable reductions in AT&T's long-distance rates.

NEWS SUMMARY

SPECIAL REPORT

More in Big Business/Followers 80

The U.S. Supreme Court may decide whether state criminal statutes can be used to control copyright violators, offering a new avenue of relief to software manufacturers/4

One of the Software Protection Fund's founding fathers — Ashton-Tate President David Cox — talks about piracy, pilfering and the microcomputer software industry/4

Site licensing could offer one way to curb corporate microcomputer software piracy/5

America's first 1M-bit dynamic random-access memory chip has been developed by IBM on its Vermont manufacturing line/8

Along with the Cyber 180 family of processors, Control Data Corp. released a new virtual address-based operating system that can be supported simultaneously with CDC's NOS 2.3 operating system/9

Peachtree Software, Inc. last week launched its first integrated micro software package/12

Five software products were honored last week as members of the Institute for Computer Programs' hall of fame of \$100 million award winners/13

Big Eight accounting and consulting firms say that the advent of microcomputers has had a significant impact on their profession/15

Coopers & Lybrand, the New York accounting and consulting firm, announced an \$8 million education grant program to aid computer-related education in U.S. accounting schools/18

MIS managers desire multitasking microcomputers, but are unwilling to turn to superminis to fill this need, according to a survey from Newton Evans Research Co., Inc./14

John Hancock Mutual Life Insurance Co. has entered the computer business, albeit on a very small scale/15

The Micro-Multitasking Connection: The advent of microcomputer-mainframe links will cause DP to rework its traditional structure, a consultant predicted... The need for microcomputer-mainframe links is becoming a major concern, but users are still asking some fundamental questions... Even if you are not comfortable with establishing a policy for linking microcomputers to mainframes, you should get one in place soon, a consultant advised... Some applications are well suited for microcomputers, some for mainframes and some for a combination of both. A consultant offers some guidelines/16, 18

A data interchange network is being implemented in a series of pilot projects that could save wholesale food distributors and manufacturers up to \$500,000 a year/22

Contrary to popular predictions, high technology will not provide a great number of high-paying new jobs, according to a report released from Stanford University/23

The damage caused by the twisters that slammed through the Carolinas March 28 might have been a lot worse if they had not been predicted hours in advance with the help of a \$2.2 million Weather Service system/24

In what will be the company's first commercial application of its computer products, AT&T recently demonstrated the electronic messaging system it will operate at this summer's Olympic Games/26

The U.S. Department of Commerce's Patent and Trademark Office recently awarded a contract for the development of an automated system for processing patent applications/27

The European antitrust case against IBM is still on the books/28

A former law firm employee has pleaded guilty to breaking into his firm's secret computer files via its word processing system/30

A meat-packing plant turned to its mainframe rather than to microcomputers to run spreadsheet programs/33

Repealmen are on the scene immediately when a piece of machinery goes down at the Baxter Travenol Laboratories, Inc. production facility, thanks to a shop floor data collection system/34

The Seattle Seahawks will begin making their picks tomorrow in the National Football League draft with the help of a local-area network/36

A Jersey firm has employed an automated system to step up collection procedures/37

Moving from a batch to an interactive system out a trading firm's costs and helped it provide more timely information to its clients/38

A local government in Newfoundland implemented three on-line systems in two months and training 300 users to utilize the system/46

International Report/28

Turnaround Time/28

Managers on the Move/30

Call for Power/47

Calendar/47

IN-BETWEEN

Enhancements to DOS/VSE/49

EDITORIAL/34

SOFTWARE & SERVICES/37

COMMUNICATIONS/71

SYSTEMS & PERIPHERALS/81

MANAGEMENT/91

COMPUTER INDUSTRY/111

ADR[®]WARE[™]

ADR[®]/DATACOM/DB[™]

The only relational
data base management
system that does the
big jobs as easily as the
small jobs.

We've taken state of the art to a new state: Easy and Available.
Before you make a software decision, call ADR (201) 874-9000.
Or fill out and mail in the coupon.

- ☐ Please send me more information about ADR[®]WARE
☐ Please send me information about ADR seminars

APPLIED DATA RESEARCH INC.
Route 200 & Orchard Road, CVA-8, Princeton, NJ 08540

Name

Position

Company

Address

City State Zip

Phone Number

Computer Equipment

ADR[®]WARE

From idea to application,
we get you there faster.

NEWS

Supreme Court may OK new way to fight pirates

By John Salsman
CW Staff

When Robert Larry Crow was arrested for selling bootlegs of singer Tammy Wynette's Golden Ring album at flea markets in Florida, he probably never imagined that his case would one day hold a good deal of significance for the authors and publishers of computer software.

But the continuing legal battle involving Crow has moved to the highest judicial arena, as Florida argues its right to use state criminal statutes to prosecute cases that would otherwise fall under the jurisdiction of federal copyright law. If Florida is successful, the U.S. Supreme Court will reinforce recent decisions in three other states and provide victims of software piracy with an avenue for relief that circumvents the problems and delays involved in federal criminal copyright prosecution.

According to Florida Assistant Attorney General Gregory C. Smith,

Crow was convicted in 1979 of dealing in stolen property and sentenced to five years in state prison. The prosecution's case was based on the stance that Crow had deprived Wynette of money — royalties — to which she was entitled based on contractual rights separate from her copyrights.

"By selling the duplicate copies, Crow deprived her of money that she would have received for her work," Smith said. "That was the right we were trying to protect. We were saying that this man dealt illegally in the contractual rights of the artist."

Crow did not contest the fact that he had violated copyrights, but he countered that Florida was barred from prosecuting him by the Copyright Act of 1976, which preempts state actions in cases involving copyright infringement. However, the prosecution's case held up through a range of state and federal appeals, until the U.S. Court of Appeals for

the 11th Circuit in Atlanta overturned the conviction on the basis of Crow's argument.

Last week, Florida petitioned the Supreme Court for review of that decision.

'Larger than heat'

"This case has the potential to be something larger than itself," said George Bateh, the prosecutor who originally represented Florida in the Crow case. "I think it opens up a new avenue for prosecution of copyright cases. It's the first prosecution of its type in Florida, and if it is successful in our jurisdiction, I'm sure other prosecutors would consider using it."

Criminal statutes have also been used in similar cases heard recently in California, Illinois and New York. In the New York case, state prosecutors were able to convict a record distributor of five counts of larceny for pirating sound recordings on the basis of theft of royalties. The court up-

held the theory that the royalties were property rights apart from the artist's copyright.

Whether New York will continue to prosecute copyright cases in this manner hinges on the Supreme Court's decision in the Crow case, according to state prosecutor John J. Marshall. "The Florida decision will have a great deal of influence on whether our decision stands and whether other states utilize larceny statutes in this manner. But I think it offers tremendous potential for prosecuting pirates. We saw that potential, and that's why we chose to prosecute the case."

While the cases have thus far involved only the recording industry, one expert on copyright law sees in them an opportunity for software manufacturers to combat the growing problem of software piracy.

"There are many small companies that would like to pursue pirates, but they don't have the resources," says COWPES page 6

Copyright specialist cites lack of federal prosecutions

A specialist in copyright law, Joshua Kaufman, asserts that the U.S. Department of Justice has never undertaken a criminal prosecution for software piracy under the federal Copyright Act of 1976.

Kaufman, editor-in-chief of Computer Crime Digest and an attorney with the firm of Kaufman & Biel in Washington, D.C., said in a recent interview that the reasons for the Justice Department's reluctance to bring software pirates to trial are threefold.

"Some people feel that the civil remedies available to plaintiffs, the high fines that may be imposed, are

sufficient," Kaufman said of the first reason. "Part of that is the same thing you find with hackers — people aren't convinced that stealing software is really so heinous a crime that you want to send someone to jail for it."

"The second reason is that many attorneys, including those within the Justice Department, feel they don't have the technical knowledge necessary in order to successfully prosecute a case."

"Finally," stated the law in this area is in flux, people are hesitant to prosecute on a criminal level until they are certain as to how the laws

will be interpreted," he said.

Kaufman's assertions, however, met with strong criticism from William Greenbaum, deputy chief of litigation for the criminal division of the Justice Department. "That statement is misleading. There is an implicit assumption that software companies have no complaints to the Justice Department, and that is simply not the case. We have had some cases worthy of prosecution to undertake."

Greenbaum claims that in 1981 he met with representatives from Atari Corp., Micropro International Corp. and Digital Research, Inc. to express

the Justice Department's desire to "drum up some serious criminal cases that would be highly organized." "They knew my interest," he added, "and I never heard from them again."

"At least until this time," Greenbaum said, "that industry has not been highly organized, or highly structured enough to spend any amount of time pursuing this. If they come to us with a raw case, it may not get a lot of attention. If they could come to us with a nice package of facts like the recording industry does, that would certainly get their better results."

Pilferage, not piracy, the real threat, says Ashton-Tate president

By John Salsman
CW Staff

Pilferage, not piracy, is the imminent cancer that threatens to cripple the microcomputer software industry, according to the president of a leading microcomputer software firm.

"Our biggest problem isn't organized piracy where someone copies our products and sells them for profit," said Ashton-Tate President David Cole in a telephone interview last week. "The problem is pilferage, when an organization buys one copy of the software and makes the disk and documentation available for reproduction. Pilferage is growing by leaps and bounds as microcomputer technology is adopted by larger segments of the American business community."

As chairman of the steering committee of the recently established Software Protection Fund (SPF), Cole said he is painfully aware of how much both piracy and pilferage cost the micro software industry in general and Ashton-Tate in particular. He estimated that for every authorized copy of his firm's best-selling dBase II data base management system that

is sold, as many as four unauthorized copies are generated.

SPF was organized last year by four leading micro software companies as a nonprofit, industry organization geared to frustrating illegal copying of software. The group's initial members Ashton-Tate, Lotus Development Corp., Sorcim Corp. and Microsoft, Inc. — began a membership and funding drive at the recent Softcon Conference in New Orleans (CW, Feb. 27). A second meeting is slated for Comdex Spring in Atlanta, where Cole said SPF will unveil a comprehensive public relations campaign targeted at corporate, rather than individual, abusers.

"Even though the members of SPF are competitors, we are also industry players, and we have a vested interest in how the industry emerges," Cole said. "As a group, our focus now is to use our considerable talents to inform the public about their rights and responsibilities as users of software."

"Users have a responsibility not to rob the vendor of the revenue needed to innovate," Cole said. "It will be at least another seven to 10 years before you see really dynamic soft-

ware that shifts the balance of power from those who know how to use computers to those who are in need of what computers can do. It would be terrible to nip that in the bud."

"It is the smaller companies who are responsible for much of the innovation today, but they can only grow if the climate is healthy."

See PIRACY page 6

Second-class postage paid at Framingham, Mass., and additional mailing offices. **Computerworld** (ISSN 0010-4841) is published weekly, except: January (8 issues), February (8 issues), March (7 issues), April (7 issues), May (7 issues), June (7 issues), August (8 issues), September (8 issues), October (7 issues), November (8 issues), December (8 issues) and a single combined issue for the last week in December and the first week in January. Second-class postage paid at Framingham, Mass. 01701.

Copyright © 1984 by CW Communications, Inc. All rights reserved. Computerworld can be purchased on 35 mm microfilm through University Microfilms Int., Periodical Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone (313) 771-4700. Computerworld is indexed/abstracted by CompuText, for subscription information.

PHOTOCOPIED REPRINTS: permission to photocopy for internal or personal use, or the internal or personal use of specific clients is granted by CW Communications for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$0.50 per page is paid directly to Copyright Clearance Center, 21 Congress St., Salem, MA 01970.

Permissions to photocopy does not extend to contributions articles followed by this symbol: 

Special requests should be addressed to Nancy M. Sherman, CW Communications, Inc., Box 881, 375 Commonwealth Ave., Framingham, MA 01701. Phone (617) 893-0300. U.S. \$2.00 a copy; U.S. — \$4.45 a year; Canada, Central & S. America — \$11.00 a year; Europe — \$18.00 a year; all other countries — \$24.00 a year (annual service). Four weeks notice is required for change of address. Please allow six weeks for new subscription orders to begin.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Dept., Box 881, 375 Commonwealth Ave., Framingham, Mass. 01701.

Site licensing suggested as software piracy deterrent

By Paul Krasnowski
City Hall

Site license agreements can cut corporate microcomputer software piracy by 30% to 80%, according to Andrew M. Seybold, contributing editor to Seybold Publications, Inc. in Torrance, Calif.

The site license agreements would allow large corporations to copy software and documentation and distribute it to employees after paying the vendor a nominal fee — \$50 to \$100 — for each copy. The corporation would also pay the vendor a set annual fee for maintenance and enhancements.

While no software vendor has adopted Seybold's particular plan, a number of companies, including Lifetree Software, Inc., Microsoft, Inc. and Digital Research, Inc., are reportedly signing other types of site licensing agreements with volume software purchasers.

"Site licenses help the manufacturer curb piracy and recognize large corporations' claims that they should not pay retail prices for software," stated Jervale Davis, a senior partner at Schroeder and Davis, a Monterey, Calif., law firm that represents a number of microcomputer software firms.

Unanticipated software costs drive up the price of a corporate user's personal computer and encourage piracy, according to Seybold. "Many users neglect to include the price of software in the initial purchase of a microcomputer," he explained. "Faced with paying \$400 or \$500 for software, they copy other employees' programs."

"Users do not consider this practice piracy; they consider it sharing corporate resources. While no company condones this practice, it is difficult to control."

Site licenses offer the user volume discounts of 35% to 50%, Davis estimated. Moreover, Seybold noted, low prices encourage central software purchasing.

Lifetree Licensing

Lifetree, which produces the Volkwriter word processing program, initiated a site licensing program six months ago. The agreement stipulates how many Volkwriters the user company will purchase and allows the buyer either to duplicate the programs and documentation or to receive copies from Lifetree, according to Jim Rodgers, manager of corporate sales at Lifetree.

To protect against piracy, Lifetree includes with each volume purchase a metered device that issues a serial number for each program. Lifetree will not upgrade a program without a serial number or provide technical assistance to a user without a serial number.

When the agreed-upon number of programs are given to employees and all serial numbers are used, the user company has to sign another licensing agreement with Lifetree for additional copies of the program.

Other companies include clauses in their contracts that allow the manufacturer to audit the user periodically to ensure payment for each copy of a program, according to Davis. "Since the manufacturers usually deal exclusively with the data processing department, completing the

'Faced with paying \$400 or \$500 for software, [employees] copy other employees' programs. Users do not consider this practice piracy; they consider it sharing corporate resources.' — Andrew M. Seybold, Seybold Publications, Inc.

audit is relatively easy," Davis said.

But some software manufacturers, such as Ashton-Tate, say they are unable to audit large firms. "Site licensing represents economic suicide," said Carl Critchfield, vice-president of sales at Ashton-Tate. "Ashton-Tate couldn't afford to audit a company as large as AT&T."

There is no simple method for determining which employees bought a program and how much they paid for it."

Site licenses may pose problems to users as well as manufacturers. According to Davis, users sacrifice technical support for lower prices. "Manufacturers feel that the data

processing department can provide technical support to corporate microcomputer users. Only when the data processing department encounters a serious problem can it call the manufacturer directly."

Another limitation is the creation of procedures and allocation of personnel in order to coordinate a site licensing program.

Despite these drawbacks, Lifetree's Rodgers thinks that interest in site licensing will grow. "Currently, there are not enough manufacturers offering site licenses to consider it a trend," he said. "But I expect site licensing activity to grow substantially in the next 12 to 18 months."



48 New Enhancements in (FDR) Fast Dump Restore Ver. 4.8

48 new ways to upgrade your DASD management capabilities, efficiency and productivity — all part of our continuing commitment to our customers.

FDR Major New Features

- VSAM DF/EF Support
- ICF Catalog Dump and Restore
- Data Set Enqueue Option
- Compacting Active Volumes
- Using Disks or MSS as the Backup Volume
- %FREE Option

Now Others See Us... and Report

May we refer you to the clipping statement in DATAPRO 70 February 1984 — 70E-528-01c, Software Report. Subject — FDR/COMPACTOR/ABR, Innovation Data Processing Incorporated: "The general consensus of opinion is that FDR is the best product on the market, which is also reflected by the very large number of users, and, with the constant enhancements made by the vendor, it will probably remain in that position."

INNOVATION'S COMMITMENT TO THE FUTURE AND OUR 6000+ USERS —
"We'll Keep Working On Our Version of It, In '84... and Beyond."

Try 90 Days of FDR Free

For the DASD MANAGEMENT SYSTEM of your choice and a copy of the DATAPRO 70 Report, call (201) 777-1940 or write to:

INNOVATION
DATA PROCESSING
970 Clifton Ave., Clifton, NJ 07013

48 New Features Totaled by Program	
FDR Ver. 4.8 Enhancements	5
SAR Ver. 4.8 Enhancements	3
DSF Ver. 4.8 Enhancements	9
CPK Ver. 4.8 Enhancements	11
ABR Ver. 4.8 Enhancements	20
More in '84	48

NEWS

VDT from page 1

VDT laborers — to see if VDT use really does place pregnant women at an increased risk.

A large portion of the nation's 10 million VDT workers — most of them women — seemingly fear there is a link between their terminals and pregnancy problems. Labor unions and women's groups claim they are beleaguered by phone calls from worried expectant mothers.

The National Association of Working Women, better known as NAW, claims VDT workers endanger pregnant women and said it has uncovered a number of "cluster sites" of pregnancy problems (CW, Jan. 16). But officials at Southern Bell in Atlanta, which is one of 9 to 5's cluster sites, told *Computerworld* they had determined that "VDTs do not cause a problem."

Teacher requests not honored

As a result, Southern Bell "will not honor a [teacher] request made specifically to that effect," a spokesman said. "If VDT work is something we all have to live with," he added, calling VDT health hazard claims "the new microwave scare."

A spokesman for United Airlines, whose San Francisco reservations center was also named by 9 to 5 as a cluster site, said there have been "no requests from people to move off the machines either in San Francisco or anywhere else we have a telephone reservations office." Moreover, he said, "It's amazing that we have 10 other reservations offices, and yet none of them is a cluster site."

But women employed in a growing number of union shops have won the right to demand non-VDT work while pregnant. Time, Inc., Bell Canada, the city of Hancock, New York's Village Voice's weekly newspaper, *Mother Jones* magazine, Boston University,

the city and county governments of San Francisco, the rent-control board in Santa Monica, Calif., the Canadian federal government and the provincial government of Ontario have all agreed to find alternative work for women who fear that operating a VDT may harm their unborn children.

Unions hail accord

Unions hailed the accord. "To put it nicely, it's better to be safe than sorry. We don't want to be part of the statistics [that may indicate] there is a problem," Alecia Rankin, a member of the Service Employees International Union in San Francisco, said.

If unions hailed the accord, industry groups denounced them. "We do not see the need for alternative work," Claudia James, legal counsel for the American Newspaper Publishers Association (ANPA), said. "These are emotional concerns, and the proper solution is education, for people to understand. To permit this [alternative work] is almost to admit there's a problem."

The Computer and Business Equipment Manufacturers Association (CBEMA) has enlisted ANPA along with the American Electronics Association, the Association of Data Processing Service Organizations, Inc., the Electronics Industry Association, the National Computer Graphics Association and 16 other trade groups in a coalition to fight restrictive VDT legislation and the growing perception that VDTs pose a health hazard. Charlotte LeGarde, a CBEMA official, said that employers who agree to alternative work proposals are "giving in to a baseless fear."

Gordon agreed, calling alternative work schemes an overreaction. "You don't have to leave the workplace in order to deal with this. Those who are promoting it [alternative work] are promoting fear instead of reason,

way to protect people who, under the copyright law, are at the mercy of overworked and understaffed U.S. Attorneys."

Despite the fact that the cases to date have involved only royalties, Kaufman feels the state criminal statutes could also be interpreted to include theft of profits. "If the theory in these cases is accepted, it would also apply to profits," he ex-

California bill would reassign pregnant VDT users

So sure are unions that VDT workers should be reassigned to other tasks during pregnancy that they are making in at least one state to engrave it into law.

In California, the so-called Hayden bill would require employers to find alternative work for pregnant VDT workers who request it. Named after its author, Southern California Democrat Tom Hayden, A.B. 3176 would also mandate radiation shielding for every VDT used on the job and require employers to give their workers six months' written notice of any plan to install new hardware.

The measure was reported favorably out of committee on a 7-4 vote earlier this month.

AEA strongly opposed

Alan Foster, manager of state government affairs in California for the American Electronics Association (AEA), declined to predict how the bill might fare in the state legislature, but said the AEA is lobbying hard against it.

"The cost would be astronomical," Foster said, pointing out that approximately 750,000 VDTs are used on the job in California. He said the bill might force employers to pay at a low \$50 per unit charge for bringing the machines up to the

she said."

While J. Smith, manager of human factors engineering at Hewlett-Packard Co., agreed,

"These people [who are promoting alternative work] are well inten-

tioned.

"It's an avant-garde theory, and one that could be construed as stretching the law, but it seems to be saying that programmers and manufacturers have contractual and property rights apart from their copyright."

Whether prosecutors in other states will begin to use criminal laws in copyright cases also depends on

Hayden bill's swift, the price tag statewide would reach \$37.5 million.

Hayden's bill is being pushed by labor. Unsuccessful at organizing in the Silicon Valley, unions admit they look upon the proposed law as a way of achieving what they might otherwise demand at the bargaining table.

"That is an element, of course," said Alecia Rankin of the Service Employees International Union in San Francisco.

"But that's not the only way we look at it. Right now, if you're pregnant and working on a VDT and worried about its possible harmful effects, you can't do much other than get work at a place where employers take better care of their workers."

Labor is not unanimous in its support of the Hayden bill, however. Naomi Pais of District 65 of the United Auto Workers, the local that negotiated the alternative work accords for both The Village Voice and Boston University, warned that mandating alternative work might lead employers to insist upon it to reduce their liability in the case of pregnancy problems. And that, she cautioned, might close off advancement paths to women.

tioned, but they just don't understand. This is an issue having to do with the total workstation, not just with one unit [the VDT]. If there is a problem, we'll never find out what it is by running away."

the scope of the individual statutes. "The New York case, for example, has no power as a precedent except in that state. But if I was a prosecutor anywhere else, I'd look to my lawyer's statute to see if it could work," Kaufman said.

"It's my impression that the New York statute is not much different than those in other states," Kaufman added.

COPIES from page 4

[but] they can't afford to bring a civil suit for damages," said attorney Joshua Kaufman, editor-in-chief of *Computer Crime Digest*. "There has also been a general reluctance on the part of the Justice Department to pursue criminal copyright cases. These decisions have given state prosecutors a tool. It gives them a

PIRACY from page 4

In its public relations efforts, Cole said, SFF must walk a fine line between informing users about the problem of software piracy and accusing them. "It's more a problem of misunderstanding than outright abuse. If you talk to MSB directors, what they are looking for is constructive solutions for managing the proliferation of software and computers in their organizations. They want to know how to avoid violating the law and incurring liability."

But a major obstacle that SFF must overcome is what Cole calls the deep-seated misconceptions that abound about the micro software industry itself.

"When I talk to users, I am amazed to hear them say that piracy is not a problem because our profit margins are huge. Some even say that the reason our margins are so big is because people are pirating our products," he said.

"To be honest, none of us is threatened at this point," Cole admitted, "but if we leave the current forces unchecked, if we don't deal with the issue of how to regulate intellectual property, we are likely to kill the industry before it reaches fruition. If we reach the point where a sizable portion of users feel they have the right to duplicate our products because they have paid for one copy, we don't stand a prayer of maintaining a vital product line into the future."

Cole realizes that SFF is facing an uphill battle. "We have a variety of case histories in other industries that indicate that the piracy problem is likely to get worse before it gets better."

"But we are trying to draw on the experience of those related industries and learn from their mistakes. We want to anticipate the larger problems before they have a detrimental effect on the continued evolution of micro software."

Federal copyright statutes 'not the problem'

Federal copyright law is not to blame for the growing problem of software piracy, according to the chief spokesman for the Software Protection Fund (SPF).

"The copyright statutes are not the problem," said Ashton-Tate President David Cole, who is also chairman of the SPF steering committee. "It is clear to me that the copyright laws are already broad enough to cover software piracy."

The SPF has presented a lengthy position paper to the U.S. Department of Justice outlining a number of possible improvements to the Copyright Act of 1976. But the proposed amendments were simply

"fine tuning," Cole admitted, and would do little to address the real forces behind microcomputer software piracy and pilferage.

"Just having something protected under the law doesn't mean that the population will comprehend the law. Even with our amendments in place, we still need public awareness, improved technical protection for our software and better enforcement tools," Cole said.

One such tool that SPF is hoping to develop is an expert witness program that will provide law enforcement agencies with the technical expertise necessary to prosecute software pirates successfully.

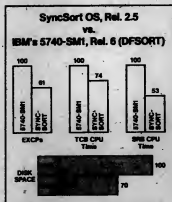
Thoroughbred

Meet the newest champion in the world's greatest sorting stable!

(SyncSort OS 2.5)

Call (201) 568-9700.

Find out why it takes a SyncSort to beat a SyncSort.



syncsort
INC.

Here we go again—improving the Sorting Breed!

That sleek young thoroughbred out in our main paddock is SyncSort OS, Release 2.5. It's by SyncSort 2.4 out of that celebrated brood mare, High Technology. And it's destined to win a lot of prizes on OS/VS and MVS/XA tracks.

IMPROVING THE UNIMPROVABLE: Until now, SyncSort 2.4 was the best OS/VS sort program ever bred. It was far faster than any IBM sort. And it was easier to use, too—thanks to a tack-room full of advanced features.

SyncSort 2.4 probably could have continued to win prizes for years. There was only one catch—it wasn't good enough for us.

PICKING TOMORROW'S WINNERS: We knew that new hardware and software systems would create opportunities for evolution of advanced sort programs. Speed would still be essential. But productivity would continue to skyrocket in importance. So that's the way we bred 2.5.

FASTER SORT PERFORMANCE: We've added new sorting techniques to SyncSort 2.5 to make it the only sort that outperforms 2.4. You can expect savings in critical resources up to those shown at lower left. And that can add up to a big increase in total systems throughput.

NEW PROGRAMMER PRODUCTIVITY FEATURES: As any seasoned sort-watcher knows, there's a lot more to data handling than sorting. SyncSort 2.5 introduces a Data Utility set that applies its proven techniques to a wide range of processing and reporting jobs.

For example, with a single execution, 2.5 can sort, format and present data in virtually any form you want:

- **SortWriter**—a powerful tool that can produce extensive reports as a by-product of your normal sorting—without user exits and the associated programmer investment. Headers, trailers, total and sub-total capabilities provide flexible formatting.
- **Record Formatting**—To existing features like INCLUDE/OMIT, INREC/OUTREC, SUM and others—all of which have been expanded—2.5 adds new and useful capabilities like data conversion, editing, insertion of literals.
- **Multiple Output**—From a single sorted file, you can create multiple files and reports. Each can include the same or different data as determined by INCLUDE, OMIT, OUTFIL or OUTREC parameters.

If you're tired of betting on sort programs that empty your pockets of resources and are tough to handle, give us a call. We'll arrange to have SyncSort OS 2.5 run a few furlongs on your own turf.

Syncsort Incorporated 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

NEWS

CONTROL DATA CORP.

System Configuration	Cyber/180 S10	Cyber/180 S20	Cyber/180 S30 (Dual CPU)	Cyber/180 S40	Cyber/180 S45	Cyber/180 S50	Cyber/180 S55 (Dual CPU)	Cyber/180 S60	Cyber/180 S65 (Dual CPU)
Relative Performance*	61	97	175	230	308	743	1,338	1,814	3,428
Storage	1.0	1.8	2.6	3.8	8.5	12.5	22.5	32.5	66.1
Memory Size in Bytes (Main Memory)	256-1024	256-1024	256-1024	256-1024	409-1024	409-1024	409-1024	804-32768	804-32768
Performance Price (Memory Price)	\$147,302 (\$147,302)	\$248,500 (\$248,500)	\$384,500 (\$384,500)	\$740,000 (\$740,000)	\$1,275,000 (\$1,275,000)	\$1,750,000 (\$1,750,000)	\$2,840,000 (\$2,840,000)	\$3,360,000 (\$3,360,000)	\$6,000,000 (\$6,000,000)
License Price (License Price)	\$7,108 (\$7,108)	\$6,400 (\$6,400)	\$14,400 (\$14,400)	\$23,775 (\$23,775)	\$39,330 (\$39,330)	\$53,770 (\$53,770)	\$86,390 (\$86,390)	\$134,000 (\$134,000)	\$226,000 (\$226,000)
Machine Cycle Time (Time)	50	50	50	50	10	10	10	10	10
Elements (Elements)	6-18	6-18	6-18	12-24	12-24	12-24	12-24	12-24	12-24
Cache (Cache)	None	None	None	10K or 32K	10K or 32K	10K or 32K	10K or 32K	32K	32K
Bus Architecture	No	No	No	No	No	No	No	No	No
Price per 1M Bytes of Main Memory	\$7,500	\$7,500	\$7,500	\$15,000	\$25,000	\$25,000	\$25,000	\$60,000	\$60,000

1. CPU estimates based on vendor-supplied information. Relative performance ratings are based on an IBM 370/158-2 equating 65. These numbers were determined by putting the processor into perspective with other systems; they do not constitute a buyer's guide. Actual relative performance may vary with the application, peripherals and software.
2. Vendor claim.
3. Includes processor, power supply, console and all peripherals (except for the S10, S20 and Dual S20, which do not include console).

CDR

CDC

been retained and now makes up the mid-range of the Cyber 180 line.

According to CDC, the "multi-stage" architecture of the Cyber 180 line allows the processors to run two operating systems in the same memory and CPU — the 6-bit or 60-bit word NOS already used on the Cyber 170 line and the 8-bit or 64-bit word NOS/VE.

The NOS/VE instruction set was embedded in the Cyber 170 Series 800 processors without customers' knowledge when the Series 800 was introduced in 1982. CDC officials said the Cyber 170 Models 835, 845 and 855 can be upgraded by software changes that take a couple of hours.

Under NOS/VE, user address space is organized in segments, with each segment having a 31-bit address range. A user may have 4,000 segments for each processing cycle.

At the high end of the Cyber line, the 980 has a liquid-cooled, micro-coded central processor supporting 8M bytes to 32M bytes of main memory. The cooling system is water based

rather than Freon-based.

In scalar mode, the 990 is 32 times more powerful than the 810, CDC said. The 990 also includes an integrated vector capability to handle instructions up to 512 elements long at a 1.8-nsec rate.

The 990 central memory contains 32 logically independent banks with a 64-nsec read/write cycle time for one bank. The 990 offers 10 to 24 channels.

The mid-range, liquid-cooled 835 and 845 are uniprocessors featuring 94K to 16M-byte memories and 12 to 24 channels. The 945 can be upgraded to the 855.

The 4M- to 16M-byte Model 855 is available in a single- or dual-processor configuration. The dual processors are independent, have individual cache memories and offer 22 times the power of the 810.

The air-cooled 810 consists of 2M bytes to 16M bytes of memory and is said to represent CDC's entry into a new market, the entry-level office and scientific area. According to CDC, it replaces the Cyber 170 Model 815 at a cost 40% less than the 815

and utilizes 50Hz or 60Hz power rather than 400Hz. It is field-upgradable to the 830.

The 810 and 830 are scheduled for July delivery. The 835, 845 and 855 are available now. The 990 is scheduled for early 1985 delivery.

Two high-end Cyber 170 machines — Models 865 and 875 — will continue in production, although they have no embedded NOS/VE instruction set.

Typical configurations are priced at \$147,300 for the 32M-byte S10, \$248,500 for the 32M-byte S20 single processor, \$384,500 for the 32M-byte S30 dual processor, \$740,000 for the 4M-byte S55, \$1,275 million for the 4M-byte S45, \$1,750 million for the 4M-byte S50 single processor and \$2.84 million for the 4M-byte S65 dual processor.

Prices for the 990 should range from \$3.35 million for the 8M-byte, single CPU to \$6 million for a fully configured, dual-processor system. Monthly costs for a one-year lease range from \$7,105 for the 810 to \$268,000 for the 990 dual processor.

CDC can be reached through Box 0, Minneapolis, Minn. 55440.

CDC fortifies chosen niche, analysts say

See no threat to other vendors

Control Data Corp.'s Cyber 180 line of computer systems will not threaten IBM or other manufacturers in the commercial or office market, but it can help CDC maintain the niche in which it has been successful — the scientific and engineering market.

That was the reaction of industry analysts to the introductory make last week by CDC.

"I think they are content in their strategy and aren't trying to get off the beaten track," observed Robert D'Amico, president of Amex Holdings Corp.

"No surprise."

Noting that the Cyber 180 series was designed to allow upgrading, he said, "IBM did a 180-degree turn as far as upgradability with its [3080 X model] [CW, Feb. 27]. In that context, CDC recognizes the importance of having confidence in how your installed base is set — no surprise, no changes in color."

D'Amico, like Urie Weil of Morgan Stanley and Co., Inc. in New York, noted that he hadn't yet seen specifications on the new CDC systems.

Well said of the CDC introduction, "It's typical of [CDC]. They don't seem to be moving outside the niche they have in [science] and engineering. They still are not a factor in the broad-based commercial marketplace."

Even though CDC is billing its low-end Model 810, as an entry-level office system, "there's no software for it," Weil noted.

IBM turns out 1M-bit dynamic RAM chip

Analysts don't expect to see it in computers for a year

RESEARCH JUNCTION, Vt. — IBM announced last week that it has produced an experimental 1M-bit dynamic random-access memory (DRAM) chip, the first made by an American company.

While a company spokesman declined to comment on when the chip will be produced for IBM computers, he said it was significant that the chip was developed on IBM's existing manufacturing lines, the same ones used to produce 64K-bit and 72K-bit chips here.

Semiconductor industry analysts were not surprised by the announcement of a 1M-bit chip. They noted that the chip probably will not appear in computers for about a year, but that its development on existing manufacturing lines could mean actual production sometime before that date.

While several Japanese manufacturers have produced experimental 1M-bit chips, 256K bits is the largest

size memory on commercially available chips.

Upgrading the 256K-bit market

"I'm glad to see Big Blue is willing to let people know how advanced its in-house capability is," said Tom Gavin, vice-president for research at Shearson/American Express, Inc. in New York. He said he wasn't surprised that IBM bypassed the 256K-bit chip market; he also pointed out that if IBM made the less powerful chip, it is available from other manufacturers.

Will Zachmann, vice-president at Intellicore, Inc. in Framingham, Mass., cautioned, "It is still experimental. It's not something that is going to be in products in the next six months. I'd be surprised to see it in production systems before 1986."

Several other American manufacturers plan to have 1M-bit chips before the end of 1984, according to Zachmann.

IBM spokesman Robert Neudecker said IBM engineers produced chips with 1,048,576 memory cells "free of defects." The read time on the chips is 150 nsec, he added.

Uses Same technology

The experimental chip uses IBM's silicon and aluminum metal oxide semiconductor (AMOS) processing technology to produce circuit elements as narrow as one micrometer. Neudecker said IBM enhanced its photolithography to halve the width of the lines in circuit patterns.

Other new processing steps electrically insulate adjacent storage nodes placed as close together as one micrometer and allow the use of 16-nanosecond dielectric materials to cover the storage nodes.

The chips are said to operate with a single-voltage 5V power supply. They will be packaged on a 22-pin ceramic substrate 12mm square, using IBM's flip-chip bonding technology.

Data base meet set for June

ARLINGTON, Va. — A two-day seminar on "Data Base Management and Microcomputers for Health Care Strategic Planning," sponsored by Health Systems Associates, Inc. and Systems Advantage, Ltd., will be held June 12-14 at the Stouffer's Concord Hotel here.

The seminar will be led by Susan Perricone, president of Systems Advantage of New York. Other speakers include John F. Reilly, president of Health Systems Associates of South Salem, N.Y., a health care consulting company.

Among the topics to be explored are the need for health care organizations to address a data base environment; implementing data base management hardware and software evaluation; and micro-to-mainframe data links.

Registration costs \$605. More information is available from Perricone at Systems Advantage, Suite 810, 41 Union Ave., New York, N.Y. 10003.

Besides adding Cyber 180 line, CDC updates NOS

By Paul Gilman
CN Staff

MINNEAPOLIS—In concert with the announcement of the new Cyber 180 family of processors, Control Data Corp. last week released a new virtual address-based operating system that can be supported simultaneously with CDC's NOS 2.3 operating system on the new machines. The vendor also unveiled a version of the Unix operating system, a C compiler, a data base management system (DBMS) and a distributed communications network.

NOS/VE (Network Operating System/Virtual Environment) provides virtual address space of 8,000 bytes to each user, a spokesman said. The system also automatically separates program and data structures, allowing programs and data to be fully shared.

Facilities are provided for easily moving applications from other vendors' machines to the Cyber 180 machines, CDC said. The operating system allows an application developer to break a program into a series of tasks which can be run sequentially or in parallel or in a mixture of both. The operating system supports the APL, Basic, C, Cobol, CDC's Cybil, Fortran, Lisp, Pascal and Sort/Merge languages. NOS/VE is written in Cybil.

On-line binary debugging is supported in Cobol, Cybil and Fortran. NOS/VE also features tools to generate on-line documentation, full screen editing, a source code utility that notes changes and automatically generates the modification deck and a file management utility that provides for migration object code utilities and full record handling.

The operating system runs in parallel with NOS 2.3 so that the CPU can execute two different instruction sets, the spokesman said. The 170 state executes NOS instructions and supports real memory addressing, 60-bit words and a 12-bit mode for peripheral processors. The 180 set executes NOS/VE and supports virtual addressing, 64-bit words and a 16-bit mode for peripheral processors.

Security features complement those provided by the hardware. A program or data resides in portions of memory which can be as small as one page or consist of many pages, the vendor said. Each portion has attributes which can be checked to detect access violations before the actual page is referenced.

The newly introduced Cyber 180s

also support VX/VE, a version of Unix System V, and C/VE, a C compiler, as subsystems of NOS/VE. VX/VE emulates most Unix System kernel calls and supports most code that runs above the kernel, including utilities, run-time libraries, documentation facilities and support files, the vendor claimed. C/VE includes a run-time library so that C programs can be developed and run under NOS/VE without VX/VE.

CDC's Information Management/Virtual Environment (IM/VE) DBMS supports flexible data structuring, based on a relational model. It also provides hierarchical, network and multikeyed access methods, CDC

said. The IM/VE data dictionary centrally defines all data elements, records and user views in a data base used to plan, control and evaluate data usage.

A terminal support module is provided for application development. Full screen editing is supported with all screen definitions stored in the data dictionary. A report writer supports a nonprocedural language that can be used to describe simple reports in four or five statements, the vendor said.

The Control Data Distributed Communications Network (CDCnet) announced last week allows users to access and share resources on local or

geographically dispersed CDC systems and to link other vendors' networks to access CDC hosts. CDCnet is based on the Open System Interconnect model, a layered model design defined by the International Organization for Standardization.

Prices for the software introduced by CDC last week vary depending on Cyber 180 model. NOS/VE ranges from \$425/mo to \$7,078/mo. NOS 2.3 ranges from \$506/mo to \$4,128/mo. IM/VE ranges from \$607/mo to \$6,005/mo. VX/VE ranges from \$463/mo to \$1,328/mo. C/VE ranges from \$198/mo to \$1,066/mo.

CDC can be reached through P.O. Box 9, Minneapolis, Minn. 55440.



CORRECTIONS

Due to incorrect statements by IBM, two clarifications are needed for the April 9 story on IBM's new transfer facility programs connecting the System/36 and 38 with IBM Personal Computers. The programs allow the micros to download files from the larger machines, but do not permit file uploading. The packages will work with the Personal Computer and the Personal Computer XT, but no version for the Portable Personal Computer has been announced.

Word Concept from Concept Omega Corp. [CW, April 2] is written in SMC Business Basic and supports three terminals, not three IBM Personal Computers.

NEWS



A CLOSER LOOK

SYSTEM/38 Continued from page 1

for products, the System/38 uses its own proprietary operating system, CPT, instead of MVS.

Any migration from a 370-style processor to a significantly different architecture would necessitate a massive rewrite of existing IBM software and an equally massive personnel retraining effort. For these reasons, although the development of a mainframe series that combines System/38 architecture with multi-360 performance would benefit users immeasurably, such a product family is unlikely at present to gain widespread acceptance.

In an apparent attempt to bridge the gap between its conflicting mainframe architectures, IBM has reportedly embarked on a secret development project at its Rochester, N.Y., research facility. The objective is to produce a mid-range processor that runs 4300 series software while preserving System/38 performance advantages, according to Robin Betalick, who heads the U.S. division of Johnson, Brown & Associates, an IBM users support group.

IBM has never publicly acknowledged its aim to develop a convergent mid-range processor, but evi-

dence of the Rochester project's existence occasionally surfaces. Between last September and January, for example, the Rochester installation hired an estimated 400 programmers, according to William Petrone, president of the Northeast System/38 Users Group.

Such an extensive recruitment drive lends credence to persistent reports that a major software design and programming effort is already well under way within Big Blue's System/38 development center. Petrone said IBM declined to comment on whether it has hatched such a project.

Attention refocused

Speculation about the possible convergence of the System/38 and 4300 product lines refocuses attention on one of the information processing field's most pressing technology-related problems: Corporate MIS organizations are increasingly being forced to try to do 1980s-style computing with a system architecture that has remained fundamentally unchanged since the 1960s.

Because of the 370 architecture's growing inability to cope with modern information processing requirements, most central systems depart-

ments are "bursting at the seams," Harvey said. The underlying design of IBM's mainstream processor family "is based on files and creates heavy dependence on I/O, which is the Achilles' heel, not just the Achilles' heel, of today's mainframe operating systems."

In an effort to modernize an aging architecture, IBM a few years ago introduced XA, which, in effect, refined and enhanced the company's existing systems design. But despite its benefits, XA has only minimally eased the user community's underlying performance and capacity woes, according to some analysts.

In fact, in the long run, the architectural extension may have greatly aggravated users' troubles. The advent of XA is encouraging an ever-growing commitment to 370-style software and, thus, is "drawing customers into a compatibility chasm" from which escape becomes increasingly unlikely, Harvey said.

To enable its systems to take full advantage of new technologies and satisfy user demands for substantially expanded performance, IBM may eventually have to invent a radically different architecture rather than incrementally extend its existing design.

Can IBM wean users from outmoded 370? Opinions vary as to whether Big Blue will set different standard

By Jeffrey Bester
CW West Coast Bureau

Opinions vary widely on the question of whether IBM will ever succeed in weaning users away from its outmoded 370-style architecture and establishing a fundamentally different design standard for the next generation of high-performance mainframes.

IBM's current lineup of medium- and large-scale processors—including the 4300 and 360 series—is founded on an architecture that first arrived on the mainframe scene during the 1960s with the advent of the 360 series. Since then, the 360 system design has undergone a long series of significant enhancements and modifications, some of which coincided with the release of the 370 mainframe series and the subsequent announcement of Extended Architecture. But even in its latest reincarnation, the 360/370 architecture retains most of the key characteristics—and shortcomings—of its 1960s vintage ancestor.

At the middle and high end of IBM's mainframe line, the only major exception to the 360/370 architecture rule is the System/38, which contrasts sharply in design with the industry giant's other CPU models. With its emphasis on interactive processing, very high execution rates and greatly expanded memory requirements, the System/38's architecture makes the machine supremely well-adapted to 1980s-style computing, according to Ken Harvey, a Toronto-based independent consultant specializing in medium- and

large-scale IBM mainframes.

But will IBM ever use the System/38 as the architectural model for its next generation of central processors? Will elements of the basic System/38's design break the capacity and performance impasse that has

IBM is reportedly forging ahead with an ambitious project to produce a high-speed System/38 that runs 4300 series programs.

long frustrated users of IBM's existing 370 architecture?

Robin Betalick, an ex-IBM'er who now heads the U.S. subsidiary of a worldwide users support group, thinks not. "I don't foresee any immediate solution to the problem [of developing an acceptable alternative to the current 370 architecture]," Betalick said. "The people in IBM's large systems division are stuck between a rock and a hard place, and I see no easy way out."

A somewhat more optimistic assessment came from David Stein, executive vice-president and cofounder of the Gertner Group, Inc., based in Stamford, Conn. Stein foresees a "very high" likelihood that the System/38's underlying design will someday form the basis of a new generation of large-scale mainframe architectures. But such a radical departure from architectural tradition

"probably isn't achievable in less than 30 years," Stein said.

Classic dilemma

Questions about IBM's possible long-term direction in processor architectures come at a time when many large corporate users find themselves caught on the horns of a classic dilemma.

On one hand, customers are rapidly exhausting the capacity of their existing systems design and desperately need a replacement that can accommodate state-of-the-art technology and rapidly growing performance requirements.

On the other hand, the same organizations resolutely refuse to migrate to a fundamentally redesigned architecture for fear that such a move would jeopardize their staggering investment in software and training.

What may be a preliminary effort to resolve the performance-incompatibility dilemma, IBM is reportedly forging ahead with an ambitious project to produce a high-speed System/38 that runs 4300 series programs. But will the attempt to merge the System/38's and 4300's dissimilar architectures bear fruit? Again, opinions diverge.

Chris Herron, who heads a company that supplies productivity-enhancing software for IBM small business systems, expects the "convergent" project to succeed. In fact, the president of Fusion Products International, Inc. offered a prediction: By year's end, he said, IBM will announce a statement of intent to modify the System/38 to support MVS.

IBM conflict: System/38 vs. 4300

IBM's mid-range processor line suffers from an internal conflict that the company will eventually have to resolve, according to George Stanton, a project leader with the company's Common users group in Chicago.

At the heart of the conflict lie two mainframe families that represent strikingly different designs—the 4300, which follows in the 370 series' architectural footsteps, and the System/38, whose proprietary organization makes the machine incompatible with IBM's other CPUs.

"Many people feel IBM is currently offering two contradictory product lines," Stanton said during a recent interview. "The System/38 and the 4300 are battling heads, and IBM can't allow the conflict to continue forever."

To reconcile the contradiction, IBM might be tempted to try to merge the System/38 and 4300 into a single, hybrid processor family that boasts many of the former's architectural traits and the latter's compatibility with 370 software.

"IBM has already allocated people to the development of the convergent product line," according to Robin Betalick, president of Johnson, Brown & Associates, Inc.'s U.S. division, an IBM users support group. "But my opinion is that, because of the complexity of the undertaking, the product will never see the light of day."

In any event, IBM seems perfectly content for the time being to allow the System/38 and 4300 to exist under the same corporate roof. If recent enhancements to its mid-range processors are a reliable guide, the industry giant remains strongly committed to preserving the two parallel product families indefinitely, Stanton said.

On the System/38 side, the most recent enhancement to IBM's medium-scale mainframe lineup came just earlier this year [CW, Jan. 16] with the introduction of the Model 8. Positioned in the middle of the product line, the additional machine replaces the System/38's existing Models 3, 5 and 7.

The announcement of the Model 8 is reportedly in full accord with IBM's overall strategy of steadily expanding the System/38 in both processing power and capacity. That strategy is expected to continue well into the future.

By June, the company will estimate the product line with, in other offerings—the Model 10, which will likely double the machine's memory to 16M bytes and boost its performance by 50% to 100%, a source predicted.

NEWS

System/38 earns tag 'least understood processor'

Industry still fails to grasp system's innovative design, analyst says



A CLOSER LOOK

By Jeffrey Bosker
 Of West Coast Bureau

Nearly 54 years after its market debut, IBM's System/38 remains one of the company's least understood products, a sampling of industry observers agreed.

"Even today, a large percentage of the DP industry still fails to grasp the true nature and power of the System/38's innovative design," Toronto-based consultant Ken Harvey said. In its architecture, the medium-scale business processor departs radically from IBM's mainstream CPU families, including the 4300, 30 series and 3080.

Even though the System/38 has found its way into thousands of installations and ranks among IBM's most successful products, the implications of its idiosyncratic design have gone largely unrecognized, es-

pecially among MIS managers. "My

experience has been that it takes most MIS managers about two weeks to understand what the System/38 is all about," according to Robin Retallick, who heads the U.S. subsidiary of a worldwide IBM users support group. "But once they see the light, they're usually very enthusiastic."

One possible reason for the industry's widespread ignorance about the System/38 has to do with IBM itself. In an effort to prevent the processor's proprietary technology from falling into the wrong hands, Big Blue has gone to great lengths to keep the system a "closed box," according to Fusion Products International, Inc. President Chris Herron. Today, however, in an apparent bid to enlarge the System/38's library of application programs, IBM is beginning to "open up" the machine ever so slightly, at least to selected independent software developers, Herron said.

But whatever the source of the industry's System/38 myopia, one fact can hardly be contested: In many respects, the product marks a significant architectural advance over the more conventionally designed members of IBM's mid-range and large-scale processor lineup.

Unlike mainframes that conform to the old IBM 360- and 370-style architecture, with its inherent 34-bit and 16M-byte addressing limits, the System/38 addresses 48 bits, Harvey said. Even IBM's highly touted Extended processor's addressing constraints to 31 bits, pales in comparison to the

medium-scale machine's capabilities. The System/38 also implements

one-level addressing, which treats data and programs as tables or arrays and, thus, conceptually eliminates records and files, Harvey, who is president of CPS, Inc., noted.

Among its other attributes and claims, the System/38 boasts:

■ A full-fledged, built-in relational data base that treats all items as objects with attributes.

■ A complete implementation of IBM's fixed-block architecture.

■ Device independence, which permits users to reconfigure their

hardware without necessitating a redefinition of existing programs, an upgrade to a new software release or some other technical intervention.

■ Open-ended design, which enables the processor to adapt with comparative ease and speed to sudden advances in technology.

■ A reduction of at least one order of magnitude in technical support requirements.

■ Greatly enhanced data security features.

Despite its state-of-the-art design and technology, the System/38 has reportedly fallen far short of IBM's

original sales expectations for the product. Retallick said one reason for the machine's small installed base is that Big Blue has marketed the System/38 ineffectively.

Although it was designed primarily to operate in mainframe environments, the medium-scale processor was originally assigned to IBM's small business computer sales staff, whose experience was limited mainly to selling System/3-class products for accounting applications. "The System/38 was turned over to people who didn't really understand it or know how to sell it," Retallick said.

What do top
 computer professionals
 usually say when we
 tell them about our unique,
 completely portable
 software?

"Show me!"

Even though the System/38 has found its way into thousands of installations and ranks among IBM's most successful products, the implications of its idiosyncratic design have gone largely unrecognized.

And actually we are not surprised. After all it took us 5 years to figure out how to do it. And now that we've gotten over that hurdle our biggest problem has been convincing people that Tominy's completely portable application development system really works.

Tominy allows you to develop completely portable application programs which can be used without modification on micros as well as mainframes and everything in-between. That means no more costly and unproductive time spent in developing special systems to fit individual computers. With Tominy one size fits all.

We have such confidence in the system that we offer it with a 90 day no questions asked money back guarantee.

Because it is not possible to tell you here everything our portable application development system does, we have ready to send you a kit that not only offers detailed information on how the system operates but also shows how it is presently being used to increase productivity and reduce costs in over 1000 installations nationwide, including 25 of the Fortune 500 companies. It's yours free for the asking if you send in the coupon or call (513) 964-6605.

We are sure that after reading it Tominy will make a believer out of you too.

Tominy

Once is finally enough.

*Tominy's completely portable application development system is presently available for IBM's PC System/34, System/36, Series/1, 4300, 3000, 3700x, DEC VAX/VMS Systems, UNIX and XENIX operating systems.

- ☐ I'd like to be convinced.
 Send me your information kit.
☐ Have a representative call.

NAME (PLEASE PRINT)	
TITLE	
COMPANY	
ADDRESS	
CITY	STATE
ZIP	
TELEPHONE	

Mail to: TOMINY Inc.
 Dept. B
 4221 Watsbury Rd., Bld. #1
 Cincinnati, Ohio 45242

83-034-4-024

NEWS

Software honored by ICP for achieving high sales

DALLAS — Five software products were honored here last week for reaching the prestigious plateau of \$100 million in accumulated sales. The awards were made at the International Computer Programs, Inc.'s (ICP) 15th Annual ICP Million Dollar Awards & Executives' Conference.

Management Science America, Inc. (MSA) captured its second \$100 million award. Its general ledger system, currently installed at more than 1,000 sites, joined its human resource system in the elite category.

Other \$100 million awards went to Computer Associates International, Inc. for its CA-Dynam integrated data set management facility; Mathematica Products Group, Inc. for Rascal II, the fourth-generation language and data base management system (DBMS); Pausophic Systems, Inc. for its Keytrieve information retrieval and reporting software; and Policy Management Systems Corp. for the Policy Management System, a product for property and liability insurance companies.

The products joined four others whose sales had previously reached \$100 million — Information General Corp.'s Mark IV DBMS; Information Science, Inc.'s Incredibly rich resource system; MSA's human resource system Xerox Computer Services, Inc.'s Xerox Business Management System.

Cincom Systems, Inc.'s Total DBMS remained in the limelight for its distinction of being the only product to win the ICP \$250 million award. Total boasts more than 6,000 installations worldwide.

Eight products entered the ranks of \$50 million award winners during 1983. They include Allargo Products, Inc.'s Shadow II; Ashton-Tate's Dbase II; SIS Software Ltd.'s Midas International Banking System; Cincom's Mantle; Computer Associates' CA-Optimizer; Comshare, Inc.'s Quester; MSA's Personnel Management and Reporting System; and Pausophic's Pervasive.

In all, ICP presented 500 awards to companies that had achieved \$5 million to \$100 million in sales. Awards were also given to products that had achieved \$1 million in sales in the first year of release. One hundred and eighty sales representatives were honored for selling \$1 million or more of software in 1983.

Sixty-five products were honored for achieving sales of more than \$1 million in their first year. Of those cited, four awards went to Computer Associates, three each to Information Associates, Inc. and MSA and two each to Applied Data Research, Inc.; Boole & Babbage, Inc.; Cincom; Hewlett-Packard Co.; Informatics; Policy Management Systems Corp.; and Tower Systems International, Inc.

Peachtree enters integrated mart With productivity package

By Eric Sander
CW Staff

NEW YORK — Peachtree Software, Inc., the microcomputer software subsidiary of Management Science America, Inc. (MSA), last week announced its first integrated productivity package.

Available in late June for \$625, Decision Manager features multiple window displays and includes word processing, spreadsheet, data management, graphics, telecommunications and terminal-emulation functions, Peachtree said.

Designed primarily for the IBM Personal Computer XT, Decision Manager also will run on an IBM Personal Computer with two floppy disks, according to its vendor. The program requires 256K bytes of random-access memory and accepts either mouse or keyboard input.

Multiple window definition

Users can define up to 20 windows at once, with up to 10 displayed on the screen at one time, and data may be transferred between windows, according to a Peachtree spokesman. The package also offers a "state-saving" feature, which permits users to return to the exact point

where they ended the previous work session, according to Peachtree.

The new package includes a full range of standard microcomputer communications abilities plus a mainframe link that permits the Personal Computer to emulate an IBM S/370 terminal. This offering is broader and less specialized than Peachtree's Executive Peachpack, a micro-to-mainframe software link designed to work with MSA mainframe applications, according to the company.

Templates allow users to configure mainframe access routines, Peachtree said. In addition, Decision Manager includes on-screen tutorial and Help features.

Peachtree also announced an upgrade policy under which registered users will receive the first enhancement for a \$10 fee, which covers postage and handling.

For the following five years, upgrades will be offered for a fixed fee of \$150 per version. Decision Manager was designed to complement the company's Peachtree 5000 application programs. "For example, the streamlined word processor offered in Decision Manager allows a

user to compose draft documents that can later be polished, revised and distributed to a designated mailing list by a Peachtree 5000 user," the firm said. Decision Manager files reportedly are both data- and command-compatible with Peachtree 5000.

Mixed reviews

Like several other analysts, Esther Dyson, president of Boston Research, Inc. in New York, gave the product a mixed review last week. Decision Manager is "serviceable but hard to get excited about," she said.

Compared with some other recently unveiled integrated packages, such as Lotus Development Corp.'s Symphony and Ashton-Tate's Framework, Decision Manager is "less tightly integrated, more a collection of products bound together," Dyson said. But, she predicted, "the good micro-to-mainframe link will be its ace in the hole."

Dyson also noted that MSA will provide strong marketing and distribution support for the product.

Peachtree Software is headquartered at 3445 Peachtree Road N.E., Atlanta, Ga. 30305.

Fingerprint system brings arrests

By Edward Warner
CW Staff

SAN FRANCISCO — Arrests have been made in two murders here that had baffled police until they searched the records of their department's new computerized Automated Fingerprint Indexing System (AFIS).

The arrests were made in the separate murders of a cab company cashier and a robbery victim.

The fingerprint system [CW, March 18] matched the prints found at the scenes of the crimes and came up with suspects in each case, according to Sergeant Robert Dagit of the San Francisco Police Department's crime scene investigative unit.

The computerized, \$2.5 million fingerprint file, produced by NEC Corp., can do its tracking with only one sample print to go on.

Previously, Dagit noted, the job of matching fingerprints from crime scenes with those on file had been done manually by his office's 15 staffers, who needed at least two prints laid down simultaneously at the scene in order to make an analysis.

Dagit said police have identified more than 100 suspects in various local crimes

by using the AFIS system since its February introduction.

The only other depart-

ment with a similar system, according to Dagit, is the Tokyo Metropolitan Police Department.

RENT the new TeleVideo 751605 personal computer from USL Data Systems.

Graphics-capable 14" CRT, parallel and serial ports, and two 320 K disk drives—all standard in an integrated package.

Call us today for the office nearest you.

USL Data Systems
A U.S. Leasing Company

USL Data Systems
2880 Corcoran Drive
San Mateo, CA 94403
(800) 277-6884
(415) 272-6800 (in California)

Nobody offers more.

LEASE the new GRID program from USL Data Systems.

True 16-bit processing and fully integrated software in a 10-pound package make the GRID the perfect combination of power and portability.

Call us today for the office nearest you.

USL Data Systems
A U.S. Leasing Company

USL Data Systems
2880 Corcoran Drive
San Mateo, CA 94403
(800) 277-6884
(415) 272-6800 (in California)

Nobody offers more.

NEWS

Big Eight call micro's impact on accounting significant

By David Glasse
OW Staff

The introduction of computer technology, particularly more capable microcomputers and more sophisticated software, has created significant change in the accounting profession, according to seven of the nation's leading accounting firms.

The Big Eight accounting and consulting firms have enthusiastically adopted the microcomputer in virtually all aspects of their accounting and auditing operations. And out of necessity, they said, they have bolstered in-house computer-related training programs for new recruits and seasoned professionals alike.

"I believe the microcomputer promises to change the life of an auditor more than any other technological development to date," said Bob Roussey, a partner with Arthur Andersen & Co. in Chicago.

"Having micro allows you to

greatly expand your ability to examine alternatives within the time constraints you have," said R. Gary Dando, a partner with Ernst & Whinney in Cleveland. "I like to think it allows you to work smarter."

Effects on curricula

Both working professionals and accounting students and teachers are feeling the effects of this change. Mid-level professionals are being required to learn and develop new computer-based skills. And accounting departments at colleges and universities are scrutinizing their curricula in light of the computer.

A survey released last week by Coopers & Lybrand in New York found that more than 50% of all internal auditing will be done by computer by the end of this decade. The survey of corporate DP auditors at 200 of the Fortune 500 companies also found that those auditors today

do 85% of their work by computer, compared with less than 10% five years ago.

All the accounting companies contacted by Computerworld have some kind of in-house training classes that either deal specifically with microcomputers or use them as part of their courses. In addition, according to the Coopers & Lybrand study, 86% of the Fortune 500 companies surveyed provide computer education programs for their internal audit staff.

Roussey said Arthur Andersen has begun to make "extremely significant" use of micros in accounting, auditing, tax, consulting and all administrative areas. The firm went from not using any micros in in-house training courses two years ago to using them in 25 courses today.

The computer has had various effects on the recruitment practices of accounting firms. Coopers & Lybrand

said that within the next five years it will not hire any entry-level accountants who do not possess a minimum familiarity with computers.

More proficiency encouraged

Ernst & Whinney's Dando advises students of accounting to be proficient in the use of a computer workstation and with spreadsheet, data base management, word processing and financial modeling software.

But Arthur Jenks, a partner with Price Waterhouse & Co., said, "We don't look for any more technical requirements than before [in entry-level recruits]." And Don McGovern, a senior audit manager with Price Waterhouse, added, "In our business, it's the intelligence and judgment of our people on accounting and auditing issues that give us the answer to what we want to find. It hasn't changed the philosophy of what we do, it's just made it less tedious."

Coopers & Lybrand announces \$8 million computer education grant

By David Glasse
OW Staff

NEW YORK — Predicting that computer literacy will become an essential skill for tomorrow's accountants and auditors, the Coopers & Lybrand Foundation has announced a five-year, \$8 million educational grant program aimed at improving the quality of computer-related instruction in accounting schools.

"Tomorrow's auditors will need to be at ease with computers, will need to have access to computer power and will need to know how to use both computers and software to increase efficiency and solve problems," Coopers & Lybrand Chairman Peter R. Scanlon said at a company press briefing held here recently to unveil the program.

The need for computer skills is so great, Coopers & Lybrand officials said, that within five years, the company will not hire anyone for an entry-level accounting or auditing position who does not have a basic familiarity with computers. The company will hire more than 1,500 accounting graduates this year alone.

Four concentrations

John R. Thornton, the company's national director of personnel management, said the grant program will focus on four areas: integrating computer technology into accounting curricula, providing company internships for accounting school faculty, providing grants for students enrolled in three-year doctorate programs and contributing funds for schools' business-related research projects.

A pilot program for curriculum development will begin this summer at the accounting schools of Baylor University, Bentley College, the University of California at Berkeley, Georgia State University, the University of Michigan, North Carolina Agricultural and Technical University, the University of Notre Dame, Pace University, Pennsylvania State University and the University of Southern California. Another 90 schools will be asked to participate in the pro-

gram during the next several years.

Part of the curriculum development program will involve Coopers & Lybrand's donation of software to the schools. Two faculty members from each school will participate in seminars in which they will learn about the software and work on ways to integrate it into the curriculum.

Doyle Z. Williams, dean of the University of Southern California's School of Accounting and president-elect of the American Accounting Association, said that the overwhelming response to a recent survey he conducted of accounting school administrators "was [over] the concern [of] how to cope with the impact of the computer on accounting education."

Coopers & Lybrand officials and educators from several accounting schools chosen to participate in the program stressed that the most immediate need is to familiarize faculty members with computer technology. "Accounting educators at colleges and universities haven't been able to respond as quickly as the business community in dealing with this technological boom," Thornton said.

Faculty tests expertise

School officials said that accounting students often possess more computer skills than their teachers and are pushing for more computer-related instruction. "Typical accounting faculty members... have virtually no computer expertise, unless they completed their studies in the last

five years," Williams said.

Another area concerning educators is how best to incorporate the computer into the curriculum. "Most educators have concluded that what is needed is the integration of the computer... into the conventional courses rather than a series of separate computer courses," Williams said. He added, however, that there is a shortage of teaching materials and other resources, such as case materials and data bases.

The grant will be administered through the Coopers & Lybrand Foundation, a separate, nonprofit corporation operated by six company trustees. The foundation provides grants to colleges, universities and other institutions to support accounting and business studies.

David Recommends Texas Instruments

David Jamison Carlyle Recommends the New Generation of Printers from Texas Instruments.

Texas Instruments 850

The 850 micro printer is the first in a family of high performance matrix printers. Featuring speed (150 CPS), quality printing and graphics, plus PC compatibility, the 850 is a price performance leader with the same reliability that has made the Omni 800[®] series printers the standard in offices around the world.

Texas Instruments 707

The newest edition to the Silent 700 series, TI's 707 Portable Data Terminal uses state of the art printing and communications technology to give you all the functions needed to do business in or out of the office.

TI Printers from DPC—The Leader in Peripheral Distribution.



THE DAVID JAMISON
CARLYLE CORPORATION
5780 Buckingham Parkway
Culver City, CA 90230

New Jersey (201) 766-4000
New York (212) 784-4400
New York (212) 784-4400
New York (212) 784-4400
New York (212) 784-4400
New York (212) 784-4400
New York (212) 784-4400
New York (212) 784-4400
New York (212) 784-4400
New York (212) 784-4400

DC
THE DAVID JAMISON
CARLYLE CORPORATION

NEWS

MIS managers at top firms seen resisting supermicros

By Paul Harnischfeger
CIVIL Staff

ELLCOTT CITY, Md. — While MIS managers desire multitasking microcomputers, they are unwilling to turn to supermicrocomputers to fulfill this desire, according to a survey report recently released by Newton Evans Research Co., Inc. here.

Two-thirds of the respondents to the Newton Evans survey listed multitasking capabilities as the principal capability users will need in 1984 and 1985. While supermicros (defined as 16-bit and 32-bit systems with multitasking and multitasking capabilities) possess this capability, only 16% of the respondents had supermicros in 1983, and only 26% expect to have one by the end of 1985. The main reasons cited for not purchasing supermicros were a lack of need for all their extensive capabilities and their high cost.

The survey, mailed to 1,000 Fortune 1,800 companies and returned by 165 companies, also found that a significant number (23%) of large corporate users do not have and do not seem to want a corporate microcomputer policy. Since Newton Evans' previous annual survey found the same percentage of companies without corporate microcomputer policies, the survey report stated that there appears to be little movement toward developing such a policy in this lagging group of companies. The survey report, titled "Micro-

computer Usage Trends in Fortune Corporations," projected rapid proliferation of microcomputers in Fortune 1,800 companies. Every company polled was using at least one microcomputer, with a mean of 149 in use. Projecting a 66% aggregate increase, Newton Evans said companies should average approximately 360 microcomputers by the end of 1985.

Not surprisingly, IBM has overtaken Apple Computer, Inc. as the principal microcomputer supplier to large corporations. The percentage of companies using IBM Personal Computers rose from 77% to 92%, while the percentage of Apple users dropped from 80% to 51%.

Microsoft, Inc.'s MS-DOS operating system replaced Digital Research, Inc.'s CP/M as the standard operating system.

The main reasons cited for not purchasing supermicros were a lack of need for all their extensive capabilities and their high cost.

IBM's dominance should continue through 1984, according to the survey. Of the 45,000 microcomputers that respondents plan to purchase this year, approximately 55,000 will have the IBM logo.

Apple, Digital Equipment Corp., and Hewlett-Packard Co. will each gain approximately one-third of the remaining sales.

The IBM Personal Computer XT ranks as the first choice among users, with 91% of the companies planning to buy this microcomputer in 1984.

Following the IBM Personal Computer XT were IBM's Personal Computer, 3270 Personal Computer, Personal Computer XT/370 and PCjr, with projected purchases by 82%, 65%, 43% and 20%, respectively, of the MIS managers polled.

Almost all managers (96%) said the MIS department should play a role in microcomputer purchases. Rather than reviewing and approving purchases, the MIS department should provide a central channel for purchases and advise and assist users. Principal services the MIS department should offer include vendor recommendations, training and support and software package selection.

The report is available for \$780 from Newton Evans Research Co., which is headquartered at Suite 204, Bethany 40 Center, 10176 Baltimore National Pike, Ellicott City, Md. 21043.

Nominations under way for technology medals

WASHINGTON, D.C. — Nominations open tomorrow, May 1, for the second round of the National Technology Medals, awarded periodically by the President of the United States for "outstanding contributions to improving the well-being of the U.S. through the promotion of technol-

ogy," according to the Department of Commerce.

An evaluation panel chosen from U.S. industry, government, professional organizations and academia will judge nominees and forward recommendations to the secretary of commerce. The secretary then makes

recommendations to the president.

Nominations are accepted through July 31. Nomination forms are available from Philip Goodman, Executive Director, National Technology Medal Nomination Evaluation Committee, Room 6924, U.S. Department of Commerce, Washington, D.C. 20230.

Ever wish there were about five more of you?

Multiply programmer productivity with the Programming Environment (PE™) from Softool.

With PE you compose substantial portions of an application program from prefabricated code, and produce finished software that is fully checked out, documented and standardized!

Many PROVEN tools. PE is an integrated set of proven software tools that literally multiplies programmer effectiveness. It is like having another programming staff... on-line! Tools available include: structured languages, source code auditor, source code documenter, interface documenter, error detector, libraries of prefabricated code, testing aids, tracing aids, optimizers, flow analyzers, conversion tools... and much more.

PE is interactive and friendly; it provides a consistent user interface, plus on-line tutorials.

PE supports both FORTRAN and COBOL. Available now. Over 1000 Softool products are installed worldwide. PE is supported on the DEC VAX, DG MV, Gould S.E.I., Honeywell 6000 (Level 66 and DPS 8), HP 9000, and IBM 370, 303X and 43XX computers. There is more. PE is a stand-alone component of SOFTOOL™. A complete Change and Configuration Control Environment (COC™) is also available.

If you are looking for true software productivity increases... and for management visibility, there is only one choice: SOFTOOL.

Call for more details or a hands-on demonstration.

Proven in MIL-STD Applications!



Softool Corporation
340 South Kellogg Avenue • Costa, California 93117
(805) 944-0560 • Telex 555334

Why would a busy DATA PROCESSING PROFESSIONAL GO TO GRADUATE SCHOOL ON SATURDAY?

To be better prepared for the challenges that come on Monday.

Fairleigh Dickinson University announces a weekend program leading to an MBA in Management (For Data Processing Professionals). On the weekend when the business world slows down, an innovative graduate business administration program runs at Fairleigh Dickinson University in Rutherford, New Jersey. The program, open exclusively to experienced and academically qualified data processing professionals, leads to an MBA degree in two years of study on Saturdays.

Data processing professionals with at least five years' experience in the field, take courses in five-week modules. They progress through the program in a single group, beginning in September or February, completing three modular courses each semester.

For an application and more information, mail the coupon today. Or phone the College of Business Administration, Rutherford Campus, at (201) 489-5345.



University Admissions
FAIRLEIGH DICKINSON UNIVERSITY
150 Montross Avenue
Rutherford, N.J. 07070

Please send me more information on the MBA in Management (For Data Processing Professionals).

NAME _____
ADDRESS _____
CITY _____ STATE _____ ZIP _____
COUNTRY _____ PHONE _____
CITY PHONE _____ OFFICE PHONE _____

An equal opportunity/affirmative action institution CW 4-30

FAIRLEIGH DICKINSON UNIVERSITY

Florham-Madison, Rutherford-Wayne, Teaneck-Hackensack, New Jersey

NEWS

John Hancock becoming microcomputer "broker"

By James Connolly
CW Staff

BOSTON — It may be that everyone with a cash register — from the franchised computer store to the discount drug store to the national retailer — soon will be selling computers. But who would expect an insurance company, particularly one that calls itself a "solid" Boston insurer, to jump into the personal computer market?

That is what John Hancock Mutual Life Insurance Co. has done in buying 500 IBM Personal Computers and Personal Computer XT's for resale to its field agents.

Under a special contract with IBM, the insurer remarketed 185 IBM systems — which it bundled with software and printers — from December through March. It offers the systems for between \$4,000 and \$11,000 to over 400 general and district agents, some of whom have bought as many as 11 computers for their offices.

The insurer hopes that the microcomputers, dubbed Personal Access Support Systems (Pass), will give its agents across the U.S. the capabilities of both stand-alone processing and communications with the IBM and IBM 3080 series mainframes in the Boston home office.

According to James Jedul, senior coordinator for policyholder and field administration, a group of agents suggested about a year ago

that John Hancock explore the use of microcomputers. A study committee composed of field administrators, agents and data processing representatives settled on the remarketing idea to ensure uniformity, on IBM systems for compatibility and on IBM as a direct supplier when IBM offered more flexibility than did other distributors, Jedul said.

"The initial reason for choosing IBM equipment was compatibility with what we already had, but I think the real reason was the availability of software," he continued. "Even by the time we started looking last year, IBM had established itself as the industry standard." The agents already had access to some mainframe data, such as policy status, via IBM 3270 terminals connected to the company's Ransel (Hancock Telecommunications) network, but no stand-alone processing power.

Pass gives agents a choice between the IBM Personal Computer and Personal Computer XT, bundled with Lotus Development Corp.'s Lotus 1-2-3 spreadsheet; Software Systems' Multitask word processing system; the American College Money Manager; and the IBM Personal Financial Manager by Sigma Software, Inc.; and an in-house Expanded Estate Ledger, used for developing individualized policy proposals.

Hancock's data processing department, which assembles the agents'



James Jedul, senior coordinator for policyholder and field administration.

desired configurations at the Boston home office, also installs a Hayes Microcomputer Products, Inc. 1500B modem and the agent's choice of a NEC Information Systems, Inc. Model 1770 letter-quality printer or a wide-carriage Epson America, Inc. FX-100 dot matrix printer.

Jedul said it takes the data processing department and administration an average of less than a month to process an agent's order for a system and to configure and deliver it. Support includes a telephone hot line, an optional maintenance agreement, introductory training by regional supervisors, discussions through The Computer Store for accessories and a newsletter. The company also offers 30-month financing at 11% interest through its John Hancock Financial Services.

cock Financial Services.

The company expects to sell 500 systems during the one-year life of the IBM contract. "What's happening is that people start off with one system and as soon as somebody gets one, others in the office see it and say, 'How come he has one?' Then they get one," Jedul said.

Thus far, the program has shown promise and good results but still needs work, according to agents. Several faulted the communications network for technical problems, and some complained of a lack of training on the systems. In response, company officials said specific communications failures can be addressed individually and noted that the systems are designed with tutorials for use in the user's office.

Agents give micros mixed reviews

BOSTON — Since kicking off its Personal Access Support System in December, John Hancock Mutual Life Insurance Co. has received more than 180 IBM microcomputers to its agents.

In some cases, the Personal Computers and Personal Computer XT's have helped their users earn, or at least save, money. But in other cases, agents have been frustrated by not being able to simply plug in and run their systems and by occasional technical problems in communications linkups.

Atlanta-based agent Herbert Matzow gained experience with a friend's Personal Computer before buying his own from John Hancock. "Most of what I was doing was personal finances. My wife has a little designer business, and we ran that on it once a week."

Matzow and two other agents split the \$4,500 cost of a Personal Computer, which is used primarily by a secretary. He said the system included software with which he was already familiar, such as Ashton-Tate's Dbase II and Micropro International Corp.'s Wordstar, which John Hancock substituted for standard programs at his request. He said the system helped the trio move into the second, third and fourth statewide positions in sales through March.

The system almost paid for itself in a day. "Just after I got it, a fellow called to say he was cancel-

ing his policy," Matzow said. But a policy proposal that he assembled with the micro changed the customer's mind. "The commission on that one renewal saved 85% of what I paid for the computer."

Matzow noted that he can use the planning program to develop proposals for potential customers in minutes by just inserting an age and dollar figure, whereas in the past it took hours of manual calculations. But he wishes that he had more access to the John Hancock mainframe, access that is now limited by communications problems and by the company's decision to give agents access only to their own customers' records and general financial data.

The company also should arrange for more training, according to Falls Church, Va., general agent Guilio Padavoni. "They showed us how to turn it on and what certain keys do, but nothing came with it other than a PC-DOS 2.0 training tape," he said.

Padavoni stressed that he knows what his micro can do, but that he is uncertain how to run most programs effectively. "We know enough to know that we don't know what is going on. What I would need is a single training course that could tell me how to enter a program, no matter what the program is. I don't have the time to go to five different courses for five different programs."

OUR SWITCHES MAKE YOUR IBM SYSTEMS WORK LIKE A TEAM!



If you have more than one IBM or plug compatible processor, Digital can help you get the most out of your hardware investment. Our switches allow you to achieve backup and peripheral configuration flexibility at a fraction of the cost you're probably thinking.

Whether you have two processors or more, Digital has a switch to suit your requirements.

- Model 4101 The lowest priced matrix switch on the market.
- Model 3421 The only manually operated channel switch in the industry.
- Model 3403 A remote controlled channel switch designed for underfloor installation.

DIGITAL CONTROLS

2779 Orchard Run Road • Dayton, Ohio 45406 U.S.A. • (513) 456-3455

Dallas 214-689-0088

New York 212-381-9416

Registered Trademark

NEWS

Micro-mainframe links seen spurring DP revamp

By Paul Gilman
CW Staff Writer

NEW YORK — The emergence of viable microcomputer-mainframe links will cause companies to reevaluate their data processing structures, leading to the integration of technologies that have traditionally been separate. However, this integration period may also be fraught with many of the problems that have plagued DP for the last 30 years.

These were among the observations made by Dr. John M. McQuillan, president of McQuillan Consulting in Cambridge, Mass., in a speech to attendees at "The Micro-Mainframe Connection," a seminar held here last week.

McQuillan explained that DP has gone through a metamorphosis in recent years, moving from a batch-oriented, centralized and stable function to one that is increasingly on-line, decentralized and dynamic. In addition, corporate management has recognized DP as an asset rather than as a cost center, and manage-

ment has become much more involved in its functions.

The arrival of micros on the scene presents an opportunity for DP to take even more of a business leadership role, he said, but it must first rethink its own boundaries. "The old [information systems] categories are obsolete," he said. "We have crossed a threshold and recognized [personal computers] as a corporate asset rather than as an individual asset."

For one thing, the traditionally separate areas of telecommunications, office automation, personal computing and DP must become more closely intertwined, he said. For example, office automation has always been concerned with electronic mail and telecommunications with voice communications. But micros and local-area networks offer the technology to send voice mail.

Similarly, micros cannot be classified as either office automation or data processing tools. To bring them into the corporate structure requires that those old boundaries be erased.

As micros become more powerful, product classifications will begin to blur, McQuillan said. It will be increasingly difficult to distinguish between word processors, personal computers and workstations or between local-area networks for voice and local-area networks for data. Electronic mail, for example, can now be performed on virtually any computer hardware, as well as through a variety of telecommunications paths and service bureaus.

All this will make planning even more critical in the DP shop of the future, McQuillan stated. "You have to plan for which of these very similar products you're going to use," he noted. "In the old days, there wasn't that much of a choice."

Paradigmatic approach

Add to this the likelihood that different parts of the organization will "race ahead of others" in using the new technology, and the result will be a pluralistic approach. "The inevitable result is a collection of partial

solutions and divided management responsibilities, with the QA, telecommunications and data processing groups each responsible for a different part," McQuillan said. But, he added, "I don't think there's any way to avoid this."

To create a new information systems infrastructure, it is first necessary to decide which technologies will be part of it (for example, public or shared facilities) and which won't (such as individual micros). "Draw an information systems design and look at what's in the middle," McQuillan advised. "Perhaps it's your mainframe, or a local-area network or an X.25 network."

Decisions will have to be made about whether the network will be host-controlled or network-controlled. Will word processing be controlled or left to individuals? Will you use one local-area network or many? "Your architectural design has consequences on a number of your specific technical choices," McQuillan said.

May forum to focus on micros

PORT LAUDERDALE, Fla. — "Pcs and Workstations: Trends and Applications for Success," a forum that will be held May 29-31 here at the Bonaventure Hotel and Conference Center, will provide MIS managers with an understanding of how personal computers relate to host systems, affect end-user organizations and impact corporate productivity and profitability, according to its sponsor, Enterprise Information Systems.

Among the topics that will be discussed at the forum are the integration of the personal computer into the office systems environment, the revolution in financial software, ap-

plication strategies for success and the widening main-machine bandwidth, according to an Enterprise spokesman.

Scheduled speakers for the personal computer forum include Dr. Frederick Pagan, president of Cynnet Technologies, Inc.; Dr. Michael Zisman, president of Integrated Technologies, Inc.; and James M. McCormack, chairman of McCormack & Dodge Corp.

The registration fee for the forum is \$860. More information is available from Enterprise Information Systems, which can be contacted through P.O. Box 1154, Greenwich, Conn. 06836.

GSA plans second computer store

WASHINGTON, D.C. — The General Services Administration (GSA) will open its second computer store to serve federal customers on July 2 in Philadelphia. Its first store was opened here last year.

GSA announced here earlier this month that it has exercised an option to award the Philadelphia contract to Math Box, Inc., the private company operating the Washington store. Math Box operates the facility in partnership with other vendors who supply specific products, a GSA spokesman said.

Since the pilot store opened last August, it has offered federal agencies one-stop shopping for hardware,

training and software for microcomputer products.

It is open only to employees of federal agencies, who can buy items that are usually not accessible on the GSA supply schedule.

During its first seven months of operation, which ended in March, the Washington store, named Office Technology Plus, had sales totaling nearly \$1 million — three times the expected amount, according to the GSA spokesman. It has sold 688 microcomputers.

GSA said its contract with Math Box permits authorization of nine regional stores, including the one in Philadelphia.

Here are a few good reasons why you should make Local Data your protocol converter company.

Local Data's comprehensive line of local and remote protocol converters have been used around the world to make async-to-IBM communications simple and economical.

DATALYNX™/3274

Datalynx™/3274

remote async ASCII

protocol converter sup-

ports SNA/SDLC or

BSC protocols. 30 types of ASCII async terminals can

emulate IBM 3278 display stations. RS-232C ASCII

async printers can emulate IBM 328X printers.

DATALYNX™/3780

Datalynx™/3780

async ASCII-to-IBM 3780,

2780, 2770 and 3741 protocol converter supports

EBDCID BSC protocol on one channel and async

ASCII devices on the other two channels. Features

include transparency, mini/micro support and free

file transfer program.

INTERLYNX™/3278

Interlynx™/3278

allows the attachment of



low-cost ASCII CRT terminals or p.c.'s to 3274/3275/401 and 43XX integrated adaptor Type "A" coax ports. Interlynx/3278 enables the user to use async CRT's on IBM mainframes and switch to async applications under terminal control.

FILELYNX™/3278.

For micro-mainframe

file transfers.

INTERLYNX™/3287.

Interlynx™/3287 allows attachment of ASCII

printers to IBM Type "A" coax ports or 3274/3275/

4701 controller and 4321/4331 CPUs.

SNA LU1 SCS and LU3 capability are standard

with the Interlynx/3287. Features include parallel and

serial ports and front panel set-up.

For more information call today.

LOCAL DATA • 2701 Tuleton Street • Suite 700 •

San Jose • CA 95128

Telephone (415) 292-7125

Telex 242524

Local Data 800 757-0942

Local Data

Now Lynx to IBM.

low-cost ASCII CRT terminals or p.c.'s to 3274/3275/401 and 43XX integrated adaptor Type "A" coax ports. Interlynx/3278 enables the user to use async CRT's on IBM mainframes and switch to async applications under terminal control.

FILELYNX™/3278.

For micro-mainframe

file transfers.

INTERLYNX™/3287.

Interlynx™/3287 allows attachment of ASCII

printers to IBM Type "A" coax ports or 3274/3275/

4701 controller and 4321/4331 CPUs.

SNA LU1 SCS and LU3 capability are standard

with the Interlynx/3287. Features include parallel and

serial ports and front panel set-up.

For more information call today.

LOCAL DATA • 2701 Tuleton Street • Suite 700 •

San Jose • CA 95128

Telephone (415) 292-7125

Telex 242524

Local Data 800 757-0942

Local Data

Now Lynx to IBM.

Martin Marietta gets Navy pact for \$225 million

BETHESDA, Md. — The U.S. Navy has awarded Martin Marietta Data Systems, Inc. a 10-year contract worth an estimated \$225 million to automate personnel and payroll systems, the company said last week.

The contract calls for Martin Marietta to install more than 60 Hewlett-Packard Co. Series 3000 machines at 36 processing centers, 13 of which are overseas. It represents "a transition in data management procurement from suppliers of hardware and software to systems integrators," said Robert V. Windley, Martin Marietta vice-president for U.S. operations.

Serving 400,000 enlisted Navy personnel and reservists, the system will replace the Navy's current manual operation of the personnel and payroll systems. The system will also permit the Navy to monitor the transfer schedules of its personnel.

NEWS

Users say micro-mainframe policy a pressing issue

By Paul Miller
CW Staff

NEW YORK — Are you concerned about the fact that your company does not yet have a policy for linking microcomputers to mainframes?

You are not alone. Interviews with attendees at Technology Transfer Institute's "The Micro-Mainframe Connection" seminar here last week indicate that the issue is vexing even some very large companies. Of the five registrants interviewed at random by *Computerworld*, none had an "intelligent" micro-mainframe link in place. But all reported that the need for a policy was becoming paramount in their organizations.

Diane E. Parens, manager of Niagara Systems Services at Occidental Chemical Corp. Information Systems in Niagara Falls, N.Y., said receiving "the micro mess" has become an area of concern following cutbacks in the company resulting from the recession. "I really don't know which way to go, but I know we have to do something," she said.

The 60 known personal computer users in Parens's company had started out using the micros for spreadsheets and reporting. "But now they're starting to talk about

downloading information," she said. "I'd like to support them better and avoid making some of the mistakes DP made 15 years ago."

Jim Mosser, manager of corporate systems and programming at Marathon Oil Co. in Findlay, Ohio, agreed. "Users are screaming to download data, but we haven't yet let them do that," he said.

Shifting DP

Mosser noted that users had made "an end run" around the DP department in buying micros and are now seeking more sophisticated capabilities, including the ability to do data entry locally on the micro.

He added that the company's top data processing people "are hard-line mainframe types" and that the company is considering using mainframe spreadsheet and graphics packages in lieu of micro packages. Downloading data presents no immediate problems, but I have major fears about getting the other way. Uploading is an entirely different issue."

The question of which capabilities to give micro users and which to leave to the corporate information center was also on the mind of Michael Pichelsman, a senior analyst in

automation services at European American Bank & Trust Co. in Westbury, N.Y. "Should we just do what all the [internal] users want or leave it to the mainframe for cost reasons?" he asked.

Pichelsman noted that his company is considering whether to purchase a mainframe spreadsheet or to leave that application to the micros. He added that European American Bank also uses SAS Institute, Inc.'s SAS/Graph and Information Builders, Inc.'s Focus on the mainframe, but that users still want graphics capabilities on the micro.

"If you pull data down to the micro, you only have a limited size you can work with," he said. "We haven't decided yet which is the best way."

One user interviewed last week is taking a hands-off approach to the whole issue of establishing a micro-mainframe policy. "There's a real danger in establishing one unless you need one," said William Denobon, president of Patchbush Information Services, Inc. in Englewood, Colo.

More than 60 micros are used for a wide range of activities at Patchbush, which is currently using IBM S/370/

Systems Network Architecture communications for a micro-mainframe link. Denobon noted that he would prefer to let users do as much work as possible on micros because of the high cost of mainframe software development: "It's cheaper to train a professional engineer or accountant to program micros than it is to train a professional programmer in engineering or accounting."

One user who is looking to fine-tune his organization's current use of micros is John R. Zagors, chief of the Washington, D.C., DP office for the U.S. Bureau of Mines. Zagors's organization is looking "for a decision as to what to process on the mainframe only, on the micro only or on a combination of both."

The bureau already uses synchronous downloading from its Burroughs Corp. and Amdahl Corp. mainframes and has been quite happy with the results. But Zagors noted that telecommunications has been a sticking point.

"One of the shortcomings of [personal computers] is in communications," he said. "We're still having trouble figuring out how far away we can go and how efficient the costs are."

Policy uncertainty shouldn't stop installation, consultant says

By Paul Miller
CW Staff

NEW YORK — Large organizations should move quickly to get a policy in place for linking their microcomputers and mainframes, even

if the atmosphere seems uncertain for such a move right now, an office automation and data communications consultant said here last week. "It's better to have a policy and review it periodically than to have

none at all," Dr. John M. McQuillan, president of McQuillan Consulting in Cambridge, Mass., told an overflow audience at "The Micro-Mainframe Connection," a seminar sponsored by Technology Transfer Institute. "You in the DP organization must lead rather than follow."

Despite the fact that micro-mainframe link technologies are still in their infancy, making it difficult to estimate the benefits of the technology, a policy that is implemented immediately can avoid numerous pitfalls, according to McQuillan. These include planning mismatches between separate departments, "guerrilla warfare" undertaken by users who are frustrated

with a lack of DP leadership on this issue, the risk of loss of control and security and the possibility of delaying the benefits that micro-mainframe links can bring.

To be effective, a micro-mainframe policy must match policies for DP, telecommunications, office automation and overall business strategies, McQuillan advised. "One real sign of an immature micro-mainframe strategy is a document that could look the same for any corporation," he said. "Different companies have found completely different uses based on their business strategies."

Pitfalls that could be avoided by a

See LWK page 18

COMPUTER SECURITY - THE GLOBAL CHALLENGE

IP/P / Sep '84
Second International Congress and Exhibition on Computer Security

San-on-the-Park, Toronto, Canada
September 19-21, 1984

Speakers will include:
BACAC - EMBACAC
Sven Hyman
C. Eugene Smith
Jon Power
David Johnston
O. Rasmussen
C. G. Ouellet

President, Intel Corp., Santa Clara, CA, USA
American, Canada, Spain, Italy, Berlin, Paris, Oslo, USA
Legation, Paris, France
Sweden, Data Inspection Board, SWEDEN
National Bureau of Standards, Washington, USA
Editor, Electronic Transmission Data Reporting Service, Amsterdam, NETHERLANDS
University of Toronto, Toronto, CANADA

Topics will include:
Security Technology
Computer Crime
Legislation
T.S.D.F.
Privacy
Contingency Planning
Micro Security
Security
Access Control
Security Strategies

Mail to:
International Security
Congress 1984
380 Dundas Street West
Don Mills, Ontario
Canada M3B 1Z5

Telephone: (416) 497-8521

Please send us registration information
to IP/P-08-84, Sept. 19-21, 1984
Toronto, Canada

Name _____
Title _____
Address _____
City _____
Prov/State _____ Postal/Zip Code _____

When You Need Computer Equipment Moved! Rely On Experts

- One-Day Pick-up and Delivery
- Competitive Rates
- Specially Equipped Radio Dispatched Trucks
- Air Freight Handling
- Warehouse Facilities
- Full Insurance Coverage

Serving Southern California Since 1970

For more details,
call toll-free:
(800) 821-5270
U.S. except Calif.
(800) 521-5537
California



**Southern California
Delivery Service
Computer
Transportation, Inc.**

2514 E. 48th Street, Los Angeles, CA 90008

NEWS

Speaker offers guidance on micro, CPU applications

By Paul Miller
CI Staff

NEW YORK — Now that you have some control over the purchase of microcomputers in your organization and perhaps even some connection to the mainframe, how do you decide which applications are best for which machine?

A speaker at Technology Transfer Institute's "The Micro-Mainframe Connection" seminar held here last week offered some guidelines for dividing the tasks of the two machines, as well as for using them in concert.

Micros boast dramatic ease-of-use benefits, flexibility, independence from data processing and low cost, said Dr. John M. McQuillan, president of McQuillan Consulting in Cambridge, Mass.

An ideal use for them is on a project that can be distributed either geographically, by time or by responsibility.

For example, branch offices or distributed departments at headquarters can each use their own micros effectively, he said.

In addition, jobs that can be processed in stages by different groups or divided up by responsibility lend themselves well to micros, according to McQuillan.

The small machines are also appropriate when intelligence and data should be stored and processed locally, such as in retail stores or on production lines, he said. They can also be used for personal data, such as that found in a personal telephone directory or department record books.

Ad hoc queries, one-time calculations, brief memos and pilot projects are also prime targets for micros, McQuillan said. The machines are also best used when good quality packaged applications are available

that would otherwise be difficult to write on the mainframe.

The mainframe, on the other hand, is best for applications involving shared resources, large processing, centralized data and the need for mature and powerful software, McQuillan said. Mainframes should also be considered when I/O volume is high, when response times are critical and when an entire group is to be automated.

Projects under consideration for the micro should be analyzed carefully to determine future needs. "There is a trap with [personal computers]," he said. "People start there, then go to a hard disk and soon realize they should have been on the mainframe all along. This is the real benefit of a micro-mainframe link."

Coordinated use of micros and mainframes is beneficial when the data or processing

is in two parts, McQuillan added. For example, if real figures are to be combined with projected figures, or if centralized data is to be combined with data from remote locations, a link is a useful updating tool, he said. Combinations of batch and interactive data, routine and ad hoc reports, large- and small-scale processing and corporate and individual information is also best handled by a combination of technologies.

Some of the benefits of micro-mainframe integration

can include lower telecommunications costs, disk storage, operational and development costs, McQuillan said. But do not expect the advantages of a micro-mainframe combination to be readily apparent, cautioned Bernard F. Nathaniel, principal at Temple, Berber & Sloane, Inc. in Lexington, Mass.

"In the '60s and '70s, we automated based on return on investment," Nathaniel said. "In the '80s, we're estimating based on quality of work."

LINK from page 17

coherent strategy include proliferation of micro hardware without DP knowledge. A side effect of such uncoordinated use is that people tend

to become attached to their first systems, making it very difficult to move them over to new hardware and software as it becomes available, he explained.

"Guerrilla warfare" tends

to occur when users are DP as too intransigent and impose their own de facto Declaration of Independence," the consultant noted. "Aggressive users won't wait," he said.

Meet to address AT&T divestiture ills

WASHINGTON, D.C. — The hidden problems of AT&T's divestiture will be addressed at the Network Management/Technical Conference (NM/TC) scheduled for May 23-24 at

the Sheraton Washington Hotel here.

The keynote address will be delivered May 23 by Dr. Leo Sulwys, president of Economics and Technology, Inc., analysts for the telecom-

munications industry.

Seminars will address management and design of networks, diagnosis of faults, technical control equipment, software and techniques, carrier gateways, interfacing voice and data systems and optimizing hardware, tariff and software opportunities.

The conference is aimed at corporate executives and vendors. Admission to the exhibits is free to telecommunications professionals with business or government identification, according to a show spokesman. The first conference session can be attended free; a fee is charged thereafter.

Registration for the conference is \$295.

The sponsors of the program are Avant Garde Computing, Inc.; Dynastech Data Systems; General Datacomm Industries, Inc.; Helixman Laboratories, Inc.; Racal-Milgo, Inc.; Paradigm Corp.; and the Pulsecom Division of Harvey Hubbell, Inc.

The show is being put on by Communication Networks Conference and Exposition, which is based in Framingham, Mass.

Additional information on the conference is available from Louise Myerow, NM/TC, Box 860, Framingham, Mass. 01701.



By the Beehive ATL-004 ANSI standard smart terminal and get the perfect combination of price-performance and ergonomic design. The ATL-004 includes a low-profile keyboard and eight "soft" function keys.

A large 14" screen provides crisp reproduction and maximum viewer comfort. Call us today for the office nearest you.

US Data Systems
A Unit Lanning Company

US Data Systems
2888 Campus Drive
San Mateo, CA 94403
(617) 572-4844
(617) 572-6800 (in California)

Nobody offers more.



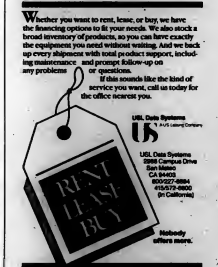
TP DATA STREAM COMPRESSION

CTOP® — the OCS Transmission Optimizer

- Extends capacity of entire network
- Instantly Improves CRT and printer response
- Reduces line busy and front-end loads
- Gives new life to slower circuits
- DOS, VSE, VSI, MVS, BTAM, TCAM, VTAM
- Over 500 users

For more details on CTOP® call: (208) 377-0336

NEW COMPUTER SYSTEMS, INC.
P.O. BOX 4795 • BOISE, IDAHO 83711-4795



Whether you want to rent, lease, or buy, we have the financing options to fit your needs. We also stock a broad inventory of products, so you can have exactly the equipment you need without waiting. And we back up every shipment with total product support, including maintenance and prompt follow-up on any problems or questions.

If this sounds like the kind of service you want, call us today for the office nearest you.

US Data Systems
A Unit Lanning Company

US Data Systems
2888 Campus Drive
San Mateo, CA 94403
(617) 572-4844
(617) 572-6800 (in California)

Nobody offers more.



For remarketers, there's still room at the top.

We're looking for new members for the "4300 Club."

If your company creates application software that will run on an IBM 4300, we invite you to consider matching your skills to our systems.

In short, IBM is looking for experienced firms that will remarket the 4300—and become what we call Value Added Remarketers.

The standards are high; but for companies that meet them, IBM has much to offer.

To start with, IBM can add strength to your marketing efforts. We can, for instance, help with product literature, with direct mail, and with business show support. IBM also has a wide range of professional channels for IBM.

And thanks to an online processing system used by IBM's own sales force, we can assist prospects with special offers to VARS and other business customers.

other highly competitive products: System/36, Series/1, System/38, the IBM Personal Computer and the System 9000 family.

For more information on qualifying as an IBM VAR, simply send in the coupon or call 1 800 IBM-VARS, Ext. 90.



Larry Humphreys
IBM Distribution Channels
P.O. Box 76477
Atlanta, GA 30358

Please send me your free booklet, "Looking for Leads."

Name

Title

Company

Address

City

State

Zip

The Union Bank of Finland handles 100% of retail banking services in 513 locations on a Tandem NonStop Computer Network."

by David A. Hays

Identifying a system for the Union Bank of Finland's nationwide network in 1987, internally selected Tandem's NonStop computer served as the ATM's "backbone" for all internal access. The bank had already moved the bulk of its more than 40 retail transaction services to a few mainframe computers for the future.

But as the workload grew, it was clear that the old processing system would not be able to support the bank's growing number of services. A new system was needed, one that

provided the performance benefit that was absolutely essential for today's electronic banking services.

Like data integrity. And an easy growth path for future expansion. No other mainframe manufacturer was able to meet our requirements for reliability and growth in such a simple, straightforward way. Not only that, Tandem was by far the most cost-effective solution.

Thanks to Tandem's comprehensive set of easy-to-use programmer tools, application development was remarkably smooth for an operation of such national scope; the system went o-

perated without a hitch, and without the slightest problem.

The future? The system already in place is a total, fully integrated transaction processing network. All we have to do to expand is add on new applications in low cost increments.

The NonStop System

The only system on the market today that can provide a dispersed network of up to 255 system elements ranging from 2 to 16 processor support rings, and 1 to 16 channels or more NonStop transaction processing channels to meet

Tandem. 100% IBM
supported by a worldwide
teaching service and an
integrating organization.

For more information
on the Tandem application
at Union Bank of California
and a copy of our brochure
"Solutions in Banking"

Contact your local sales office
for Tandem Computers, Inc.,
Incorporated, 19333 Vallecito Parkway,
Cupertino, California 95014
U.S.A. Toll Free 800-538-3114
or 408-725-7500 in California

TANDEM

NonStop Transaction Processing

NEWS

Network pilots could save grocers \$500,000 annually

By Robert Elliott
CIN West Coast Bureau

FALLS CHURCH, Va. — A data interchange network that is expected to save wholesale food distributors and manufacturers up to \$500,000 a year is being implemented in a series of pilot projects over the next three months. Coordinated by the

National American Wholesale Grocers Association (Nawga), the projects will employ IBM Personal Computer XT and Victor Technologies, Inc. 9000 microcomputers to transmit purchase orders and invoices between distributors, food brokers and manufacturers. The pilot system is intended

as a forerunner to a nationwide micro-based network for food distributors, brokers and manufacturers. The network was built by EDI, Inc., an Odenton, Md., software developer. Informatics, Inc.'s Ordernet time-sharing service is being used as the communications carrier and for format conversion.

Ordernet acts as an electronic mailbox, routing messages and information between subscribers to the network.

Nawga claimed the combination of micro workstations and Ordernet services will result in more economical and convenient information flows. One food manufacturer claimed to have speeded

up its delivery cycle times by 24 days.

The first pilot project, which went on-line at the Business Parvins and Economy Wholesale, two Pennsylvania-based food companies. Another firm, B. Green Co. in Baltimore, is expected to join the same pilot shortly.

Altogether, Nawga anticipates between six and eight pilots up and running by June 1, with at least two parties on each pilot. One pilot project, for example, is expected to link up a trucking firm, a wholesaler, a broker, a manufacturer and a bank in a single loop.

Feasibility report

A 1980 feasibility report by Arthur D. Little, Inc. estimated that an electronic data interchange system for the grocery industry could lead to annual savings of between \$196 million and \$234 million, compared with the present system of placing orders over the telephone. According to Richard Brown, Nawga's vice-president, savings to distributors and manufacturers with annual sales of \$300 million could amount to more than \$500,000 a year.

Since the mid-1970s, Brown added, there has been a major effort by the wholesale food distribution industry to transmit paperwork electronically. A Uniform Communications Standard (UCS) was developed for the industry using Ebclic, the IBM-developed transmission code supported by Nawga, the Food Marketing Institute and the Grocery Manufacturers Association.

"Up until now, the problem has been that it takes commitment [by] a major company to put the communications standards on computers and do all the associated software development necessary to interface with open purchase order files, invoice files and the like," Brown explained. The EDI system reportedly allows users' workstations to act as stand-alone devices or, alternatively, interface with the host mainframe, usually an IBM System/34, System/36, System/38, 3033 or 4341 processor.

Mainframes and minis from other vendors, such as Digital Equipment Corp., Sperry Corp. and Honeywell, Inc., can also be used, according to Joe Carley, president of EDI. "We conducted a requirement study prior to setting up the pilot projects and found that most users wanted to use their microcomputers as front-end translators to their host mainframes or minis. A few users indicated wanted to use them in a stand-alone capacity," Carley noted.

The Holoscan 28 Laser Graphic Printer Just \$12,500

- 
- Holoscan 28™**
- HIGH SPEED/LETTER QUALITY... print up to 28 pages per minute with 300 dots per inch resolution.
 - MULTIPLE FONTS...up to 4 fonts per page, and optional fonts are available from the Compugraphic® type library.
 - COMPACT AND QUIET...measures 36"H x 26"W x 24"D and virtually silent.
 - VERSATILE...now you can merge forms and text.
 - AVAILABLE NOW!



General Optonics Corp.

Two Glenview Avenue, Glenview, Illinois 60045
Tel. (815) 709-4700 • Telex 710427 GOC

I want to know more about the Holoscan 28

☐ Send Literature

☐ Contact GEC Telephone No.

Name

Company

Address

City

State

Zip

GO

NEWS

Study refutes common DP job market perceptions

Says competition for high-paying jobs to stiffen

By Paul Karamanides
OF Staff

STANFORD, Calif. — Current demand for computer science graduates will wane, and competition for high-paying, high-technology jobs will stiffen, a study recently released here maintains.

"Forecasting the Impact of New Technologies on the Future Job Market" refutes the common perception that in the next decade the growth of the computer industry will supply workers from declining industries with high-paying, secure jobs. The study was authored by Dr. Henry M. Levin, professor of education and affiliated professor of economics at Stanford University, and Russell W. Bumbarger, a senior research associate at Stanford. The study was based on statistics supplied by the Bureau of Labor Statistics, the National Science Foundation and the Institute for Economic Analysis.

Expectations of rapid growth, high pay and security for high-technology professionals are not based on reality, according to Levin. "For the last year and a half, we have collected and analyzed numerous employment surveys," he said in an interview last week. "We have not found one survey that substantiates the claim that the computer industry will supply a significant number of high-paying jobs in the next decade."

Levin agrees that employment in the computer industry will grow rapidly — 35% annually from 1984 to 1995. But because of the computer industry's small size, that growth translates into few new jobs — only

5% to 8% of the jobs created in that time period. For example, there will be 217,000 additional computer system analysts by 1995; in comparison, however, 770,000 more janitorial jobs will be created.

Moreover, the rapid growth in the computer industry will provide more low-level, low-paying jobs than high-paying technical positions, the study predicts. In the computer industry, only 26% of the jobs were technically oriented in 1980.

Levin expects that trend to continue. "Advances in technology have replaced many technical positions," he

explained. "Chip-making used to provide a number of jobs requiring technical expertise. Today, it is largely a factory process."

Technical advances also threaten programming jobs, Levin said. "Software companies are emphasizing packages that a number of users can maintain," he noted. "This trend may eliminate the need for programmers. More Cobol programmers were needed five or 10 years ago than are needed today."

An increase in military spending delayed the bust, Levin stated. "Most of the jobs added in the past few

years are the result of increased military spending, not increased private spending."

When the bust comes, Levin said, education will be the key to job security. "Having a computer science degree will no longer guarantee someone a job," he contended. "I would tell my son or anyone else interested in entering this field to get as much education as possible. That will be the key to job security."

Copies of the report are available free by writing Dr. Henry M. Levin, CERAS/ISG, Stanford University, Stanford, Calif. 94305.

Introducing the most advanced IBM-compatible bar code readers.

Bar none.



The SCANSTARS

In minutes, the SCANSTARS turn your IBM terminal into a bar code workstation. Installation is quick. Easy. And doesn't interfere with your normal operation.

The SCANSTARS incorporate the most advanced bar code scanning technology. They scan, decode and emulate IBM 3178, 3278, 5251 and 5291 keyboard functions.

Built tough to last in the factory or the office, yet compact and self-contained in a single housing, the SCANSTARS read bar codes using a stainless steel light pen or a hand-held laser scanner.

State-of-the-art SCANSTAR features include. The ability to auto distinguish among standard industry codes such as 3 of 9, Codabar, 12 of 5, UPC/EAN or 128. An auxiliary asynchronous serial ASCII input

port. A volume control for audio acknowledgement. An earphone jack for high noise environments. And five status LEDs.

The SCANSTARS. New and part of a galaxy of scanning products from Computer Identics.

Please send more information on the IBM-compatible SCANSTARS, along with the name of my Computer Identics distributor

Name _____ Title _____

Company _____ Phone _____

Address _____

City _____ State _____ Zip _____

Type of IBM terminal 3178 ☐ 3278 ☐ 5251 ☐ 5291 ☐

No. of terminals _____

Comments asked on tape standard

WASHINGTON, D.C. — A four-month public review and comment period on a revised draft American National Standard for magnetic tape labels and file structure for information interchange has been announced by X3, the ANSI committee on information processing systems.

The draft standard specifies the volume and file structure for recording on magnetic tape and the requirements necessary to process those labels and blocks. Four nested levels of the requirements on the media content and on the supporting implementations are specified.

The standard is directed toward information interchange between implementations of potentially different architectures, but consideration is afforded to local tape processing needs. The draft standard is intended to serve as a guide for designers of implementations that also support a local environment different from the interchange environment.

Copies of the draft may be obtained from the X3 Secretariat, Computer and Business Equipment Manufacturers Association, Suite 500, 311 First St., N.W., Washington, D.C. 20001. Orders must include prepayment of \$10 and a self-addressed mailing label. The comment period ends Sept. 10.

computer
identics
The Bar Code Company

5 Shawmut Road, Canton, MA 02021, (617) 621-0830

NEWS

Weather Service system helps lessen damage of tornadoes

By Robert Winters
CI Staff

KANSAS CITY, Mo. — The 1984 tornado season began with horrifying force March 28 when about 45 twisters smashed through the Carolinas, killing 66 and causing millions of dollars worth of damage. The fatalities might have been greater, though, if those storms had not been predicted hours in advance with the help of a \$2.2 million computerized system introduced two years ago by the U.S. Weather Service.

The Centralized Storm Information System (Csis) relies on four Harris Corp. Shah 6 minicomputers to compose the satellite picture of the U.S. and to combine with it weather data from the Earth, such as barometric pressure and air temperature. Csis also transmits the satellite's view of the Earth from radio signals to a picture in about six minutes, a full half-hour faster than any previous Weather Service equipment, according to Ed Ferguson, deputy director of the National Severe Storms Forecast Center here, where Csis is located.

Using Csis, Weather Service meteorologists can determine whether the dangerous combination of low barometric pressure, high temperature and rain-laden clouds is about to brew up a swirling catastrophe-maker with 200 to 300 mile per hour winds. Ferguson said Csis has boosted the storm forecast center's accuracy in predicting tornadoes from 40% to 45% to near 53%. It has also, he said, raised from 60% to 80% its accuracy in predicting severe storms.

The National Severe Storms Forecast Center, located at the edge of a region called Tornado Alley — an area that includes portions of Texas, Oklahoma, Nebraska, Iowa and Kansas — issues all of the nation's severe weather forecasts and tornado watches. Approximately 1,000 tornadoes will occur this year, Ferguson said, most of them from April

through June.

The great advantage of Csis, Ferguson said, is that it combines in one place the data that storm center meteorologists previously had to gain from a stroll past 30 ft of weather maps, each presenting a different picture of the nation, from its various temperatures to air pressures and humidity. The meteorologist would note disconcerting weather events and make a prediction of impending trouble.

Now, Ferguson said, those variables — temperature, barometric pressure and the like — can be overlaid in color on the satellite picture of the U.S., displayed on the system's

screen. That display can be transferred to a Honeywell, Inc. printer for hard copies of weather maps and data.

Csis gains its data on lower atmosphere weather conditions, something the satellite cannot provide, from 60 Weather Service ground stations, which each day send soft weather balloons carrying small transmitters. Csis also incorporates Weather Service radar data, which can tell whether a cloud mass contains rain.

Csis software and the computer system's configuration were produced by the University of Wisconsin, which also stores archival tapes

of each day's storm center data. Each computer is supported by a 800M-byte storage unit; that storage is needed, Ferguson said, because of "the tremendous amount of data points" in satellite pictures, which can arrive as often as every 15 minutes during times of impending storms.

Based on its reading of Csis, the Weather Service began issuing warnings at 2 a.m. on the severe storm that hit the Carolinas March 28, Ferguson recalled. As the storm developed, tornado watches were "issued well ahead, and every tornado that occurred was in a valid watch [area]."

REAL PRODUCTIVITY CHECK

dBASE II

TO PRODUCE THE SAME REPORT YOU CAN DO THIS...

- USE ACCOUNTS
- COPY TO WORK1 FOR TYPE = "CHARGE" .AND. DATE > "811231";
- .AND. DATE < "830101"
- USE WORK1
- SORT ON DATE TO 8:WORK2
- USE WORK2
- SORT ON ACCTNUM TO 8:WORK3
- USE WORK3
- REPORT FORM ACCOUNTS

```

ENTER OPTIONS, M=LEFT MARGIN, L=LINES/PAGE, W=PAGE WIDTH
PAGE HEADING? (Y/N) Y
ENTER PAGE HEADING: ACCOUNT CHARGES FOR 1982
DOUBLE SPACE REPORT? (Y/N) N
ARE TOTALS REQUIRED? (Y/N) Y
SUBTOTALS IN REPORT? (Y/N) Y
ENTER SUBTOTALS FIELD: ACCTNUM
SUMMARY REPORT ONLY? (Y/N) N
EJECT PAGE AFTER SUBTOTALS? (Y/N) N
ENTER SUBTOTAL HEADING: CHARGES FOR ACCOUNT
COL WIDTH, CONTENTS
001 9, ACCTNUM
ENTER HEADING: ACCOUNT
002 20, DESC
ENTER HEADING: DESCRIPTION
003 8, AMOUNT
ENTER HEADING: AMOUNT
ARE TOTALS REQUIRED? (Y/N) Y
004 10, BALANCE
ENTER HEADING: BALANCE
ARE TOTALS REQUIRED? (Y/N) N
005
  
```

Itca meet set for May 22

MADISON, Wis. — The keynote speaker for the first annual meeting of the International Teleconferencing Association (Itca), scheduled for May 22 at the Comcourse Hotel here, will be Mark Forst, president and founder of the Private Satellite Network. Itca is a 300-member group of vendors, users and research consultants who promote use of teleconferencing on an international basis.

Forst, the author of *Information Economy*, will speak on the conference theme, "Teleconferencing: Enhancing our Interactive World."

The one-day conference will feature workshops and seminars on topics including teleconferencing technologies for tomorrow, government policies and regulations affecting teleconferencing and the impact of teleconferencing on our lives and work.

Registration is \$100 for Itca members and \$165 for others.

More information is available from Itca, Suite 101, 1590 Woodside Drive, McLean, Va. 22102.

NEWS



TUESDAY TIME
Larry Long

Q We get the usual grumbling about the high cost of DP services, but never any serious complaints. This is surprising, because our chargeback system is greatly unfair. The algorithm hasn't been changed for 10 years and favors 1/8-second batch processing and discourages on-line processing.

I've been asked to investigate what we could do to create a more equitable chargeback system. I am personally against changing anything.

Any change is bound to cause problems that don't exist now.

Presently, no one is complaining bitterly. Wouldn't you agree that we should leave well enough alone? Chargeback systems, like information systems, need continuous maintenance to reflect changing technologies and needs.

Update the system now or suffer a more serious backlash in the future.

Q I'm the software development manager for a manufacturing company with about 1,000 employees.

Six hundred people work in the plant, and 400 work in the office or field sales. We are moving rapidly toward on-line interactive systems and currently support about 200 terminals.

This figure includes 50 portable terminals that are used by our field

sales staff.

Have any statistics been compiled that reflect the average ratio of terminals to employees for the various types of industries? We would like to know where we stand with respect to our peer companies. I'm not aware of any such ratios.

Most companies your size and larger don't know where their terminals are located, much less how many.

In MIB, the average ratio of workstations to programmer/analysts is approaching 1:1. Based solely on my observations, I would surmise that your ratio of 1:3 reflects a greater use of terminals than most manufacturing companies.

A 1:3 ratio may be low for insurance, banking and other companies whose employees are primarily white collar.

The same logic that supports the one programmer/one terminal theory will seem applicable to office workers as well.

If you weigh the cost of not having a terminal available when an employee needs it against the cost of the device, the scales are tipped heavily in favor of all office workers having their own workstations.

I would expect the companies that are aggressively developing on-line systems to approach a 1:1 ratio for office workers by 1987. By then, the typical workstation will be a micro that can be networked or stand alone.

Finally, I must qualify my remarks by saying that the number of installed terminals is not nearly as important as the quality and availability of software and data.

Q I manage a personnel office in which almost everything is automated except word processing. In an attempt to remedy this, I purchased two stand-alone word processing systems.

The vendor rep treated the systems as very "friendly" and sold our four secretaries could complete the programmed learning course in two days or less. It's been over a month, and we are still using typewriters.

Soon after the systems arrived, I set aside two days and asked all four secretaries to meet together to learn how to use these systems. After five days, they literally threw up their arms and refused to continue until someone could help them.

They were getting nowhere, and work was piling up, so I called the vendor and asked for assistance. He has put me off for two weeks and now won't even return my calls. Aren't vendors under some kind of obligation to respond to certain inquiries?

They have a moral obligation, but there is no legal obligation unless such service is specifically stated in a contract.

Most vendors of small equipment and computer retailers are quick to mention that they are "full-service organizations" and are "only a phone call away." Some mean it, and some don't.

I am not optimistic about your getting much help from the vendor in this case. I would recommend that you press on internally with a different approach.

Select the one secretary who appears to be the most enthusiastic about learning word processing, and ask him to give it another try. He will become frustrated, just as others have who have pounded their way through cryptic programmed instruction booklets but, eventually, he will learn the system and can teach it to the others.

Don't hesitate to solicit some assistance from MIB personnel if he gets completely bogged down.

In this situation, one person may succeed where the combined efforts of four have failed. In a group of novices, the frustration level sometimes overshadows the basic learning objectives.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 300, Framingham, Mass. 01701.

COMES TO DBMS! IT OUT

NPL OR THIS...

GET ACCOUNTS

HEADING 'ACCOUNT CHARGES FOR 1982'

PRINT DESCRIPTION, AMOUNT, AND BALANCE NOTOTAL;

BY ACCOUNT AS 'ACCOUNT' SUBTOTAL, BY DATE,

AND COLUMNTOTAL,

IF TYPE IS 'CHANGE', AND IF DATE FROM 810101 TO 831231.

The NPL® Database/Application Systems make communicating with your micro computers as easy as writing an NPL sentence. NPL stands for NonProgrammer's Language, the 4th generation language. Because of its clarity and brevity you can become familiar with NPL in just 1 day. Training costs will be significantly reduced.

NPL has been tailored especially for micros based upon the mainframe languages RAMP/S II and POCUS®. In addition to matching the power and flexibility of dBASE II®, NPL is significantly easier to use. Create advanced business applications. Perform quick and easy queries. "Plain" data entry screens. NPL power is surpassed only by its ease of use. And NPL not only runs on almost any micro you can name...IBM, Digital, Apple, Burroughs, NCR, Hewlett-Packard, Texas Instruments, Victor and under development for Macintosh...but you can do reports from other files and databases as well (so even dBASE II users can benefit.)

One more thing. NPL, the system that brings 4th generation language to micros, generally retails at \$300. (Volume discounts available.) And you can win a Mercedes-Benz 190 just for checking out this breakthrough database software at an Authorized NPL Dealer. Now building a database doesn't have to be a struggle. NPL's Database/Application Systems save you frustration, time and money.

For more information see your Authorized NPL Dealer or call 1-800-824-7111. Or write: Jim Giller, V.P.—Sales.

NPL

Desktop Software™ Corporation
CH-5287 Princeton, New Jersey 08540
THE BRILLIANT LITTLE DESK WITH THE BIG PAYOFF

NEWS

AT&T to relay Olympics spirit, events via EMS net

By Lynn Baker
CW Staff

NEW YORK — AT&T will be carrying the torch in more ways than one at the 1984 Summer Olympics.

When the 1984 Olympic Torch Relay, sponsored and managed by AT&T Communications, reaches its final destination — the Los Angeles Memorial Coliseum — on July 28, AT&T Technologies will continue to relay the Olympic Games' spirit and events via a telecommunications system capable of transmitting voice, data and video.

The Olympics is "a very unique opportunity for AT&T to showcase its technologies and applications," said Bill Hightower, AT&T vice-president and Olympics project coordinator.

He spoke at a press conference called here earlier this month to demonstrate the communications network that will be deployed at the Games.

At the core of that telecommunications system is the AT&T Electronic Messaging System (EMS). The EMS, which will connect 60 Olympic sites within a 4,500-sq-

mile area, includes 14 AT&T 3B20S superminicomputers, which run under the Unix Version V operating system; 1,700 AT&T Teletype Corp. 5410 terminals; and 300 Teletype printers.

The network was designed to meet the needs of the 50,000 people directly involved in the Games, including athletes, coaches, staff and volunteers from the Los Angeles Olympic Organizing Committee (LAOOC), international affiliates and the media.

It was also designed to be used with only minimal prior instruction. The terminals feature a menu of options to choose from in both English and French, and most operations involve single-key commands.

Each EMS terminal site will include approximately 12 terminals. According to Hightower, 12 of the 14 3B20S superminis will be used as primary units, one will serve as a standby and the 14th will be used as an administrative system. Hightower acknowledged that plans for disaster recovery have also been designed.

EMS, a multiplexed data communications network, will operate 24 hours a day and offer two basic types of service. The communications side of EMS will provide elec-

tronic mail and event bulletin boards.

The information side of the system will furnish daily sports results, comprehensive, up-to-the-minute progress reports and profiles of an athlete's performance prior to and during the Games, AT&T said.

The computers are being tied together with AT&T's SNet, a 10M bit/sec local-area network. This is connected to the communications network by an AT&T fiber-optic lightwave system that was recently made operational by the Pacific Bell Telephone Co.

The EMS permits press to compose and send stories or messages within the Olympic site and throughout the world via links to the international Telex system.

AT&T's voice communications system consists of 30 AT&T Dimension private branch exchanges with varying system configurations and features such as call waiting, call forwarding, add-on conferencing and automatic call-back to provide links for such official activities as protocol, ticketing, security and ceremonies, a company spokesman said.

The EMS interfaces with an IBM System/38 located in Long Beach, Calif., that will

be transmitting the certified LAOOC results, a Motorola, Inc. computer that operates a radio paging system, a Westinghouse system, an era Union Tech system, an IBM System/38 processor carrying LAOOC registration data and an Olympic security network.

Like the competing athletes who must put personal politics aside, AT&T and industry competitors, such as MCI Communications Corp., IBM, GTE Corp. and Pacific Bell, must also work hard to make high technology viable at the Olympics.

ON-LINE HP3000 & DEC VAX BUSINESS MANAGEMENT SYSTEMS

- C) PAYROLL
- C) PERSONNEL
- C) ADVANCED GENERAL LEDGER
- C) ACCOUNTS PAYABLE
- C) ACCOUNTS RECEIVABLE
- C) FIXED ASSETS

SUPPORT MAINTENANCE ENHANCEMENT

COLLER JACKSON INC.

SEND YOUR IMS PROBLEMS TO SCHOOL

Our instructors encourage students to bring actual programming assignments, debugging and/or design problems to class. Because they're committed to providing a real-life learning experience — experience that makes programmers immediately productive in an IBM environment.

Advanced courses, from Data Base Design, DB/SQL Applications Programming, DB and Message Format Services Programming, and Utilities to Advanced Recovery and Restart, are for highly motivated programmers who want to become IMS professionals and are willing to work hard. Our intensive training provides state-of-the-art instruction, a solid foundation in IMS fundamentals and insights into advanced material, extensive "hands-on" experience and individual attention from highly qualified instructors.

Courses are held regularly at our fully equipped classroom/computer facilities in New York City and Chicago. Class size is limited, so applications are accepted on a first come first served basis. Customized course offerings are available for on-site sessions at company installations.

For more information, call David Shapiro (212) 889-3366.

ONE PARK AVENUE
NEW YORK, NY 10016

atre
SYS-ED

REC TO IBM SNA

Now available...full SNA capability for your DEC computer! Comboard/SNA gives your terminal access to IBM interactive applications. Data can be transferred between systems transparently, all in the complete fully supported package, from Software Results.

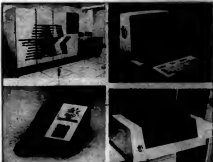
Comboard/SNA is a proven and reliable, single-board, 256KB communications computer that plugs into your DEC Unibus. Teamed with Comboard software, the system is a cost-effective solution to troublesome SNA communications problems.

Comboard/SNA allows your DEC to emulate an IBM P/Type 2 communications node. You have a full gateway into your SNA without the trouble of passing through a secondary network.

For further information, fill in the coupon below or call Software Results...the leader in DEC to IBM communications.

NAME _____
COMPANY _____
ADDRESS _____
CITY _____
STATE _____
ZIP _____

COMBOARD
SOFTWARE RESULTS CORPORATION
Call Toll-free
1-800-ERC-DATA
In Ohio call collect
1-614-297-2222
2857 Elm St., Columbus, Ohio 43211
Telex: 65-65 DEC DATA CI



(Top left) EMS' core — 14 3B20S computers. (Top right) AT&T Teletype 5410 terminal. (Bottom left) A 900-type telephone model. (Bottom right) AT&T 300 Teletype printers.



AT&T Teletype 5410 terminal station.

NEWS

Patent Office awards application processing contract

Expects to reduce backlog of 250,000 pending patents

By Peter Barfanti
CW Staff

WASHINGTON, D.C. — The U.S. Commerce Department's Patent and Trademark Office recently awarded a contract for the development of an automated system for processing patent applications.

A. J. Barfanti, a member of the Patent Office's automation project team, said the proposed system will improve the quality of the application examination process and reduce a case backlog of some 250,000 pending applications.

The contract was awarded to Planning Research Corp. (PRC) of McLean, Va., which said the contract should produce revenues of about \$8 million this fiscal year and about \$300 million over the next 20 years.

PRC will provide general systems engineering services; software development will be handled by Chemical Abstracts Service of Columbus, Ohio, a not-for-profit operating arm of the American Chemical Society. Equipment will be competitively acquired, according to a PRC spokeswoman.

Patents by 1990

Announcing the contract award, Patents and Trademarks Commissioner Gerald J. Mosshoff said, "The automated patent system is the centerpiece of our program to achieve a paperless Patent and Trademark Office by 1990."

The Patent Office employs 1,200 examiners to process about 110,000 new applications each year. Patent applications must be compared against existing applications as well as technical documents and foreign patents "to determine whether the application is something innovative," Barfanti said.

With some four million patents granted and some 25 million documents on file, the office is experiencing a tremendous "file integrity problem," Barfanti said. He noted that examiners processing new applications are experiencing a 12% rate of relevant documents misfiled or missing.

At the present time, the only automation employed in the examination process is a tracking system to determine where in the process a partic-

ular application is at any time, Barfanti said. "It does not assist the examiners," he added.

The system to be developed, following completion of a three-month design review procedure, will provide on-line text retrieval and dig-

itized images that can be transmitted and examined at an examiner's workstation, according to Barfanti.

The system will be implemented in three phases. The first phase, expected to be completed in mid-1985, will automate the examination of

patent applications in the general category of chemical, electrical and mechanical patents, one of 16 technical areas in which applications are classified. The second phase, expected to be completed in 1988, will result in the automation of the re-

maining 14 classifications.

The final phase will interface the Patent Office data base with the office's public search room, patent depository libraries around the U.S. and foreign patent offices. That phase is expected to be completed by 1990.



NEWS



INTERNATIONAL
BUSINESS
ON International
News Network

AUSTRALIA

SYDNEY — The Sydney County Council, the city's electricity utility, took an unprecedented step in allowing bids for a \$600,000 software contract to companies with packages that are not yet fully developed. The utility will accept proposals from companies that promise to provide ongoing software products until the ones under development are completed. The announcement followed the Australian Gas Light Co.'s decision to

install an IBM 3065E and a 3065 BX, the latter, due in June, will be the first X model to be installed in Australia.

MELBOURNE — After securing \$4 million in software contracts, Australia's Computer Power Group has opened a New York office. The office, one floor beneath Australian publishing tycoon Rupert Murdoch's U.S. headquarters, will be managed by Dr. Ted Prince, who is resigning from his post as director of the Australian Federal Department of Social Security.

JAPAN

TOKYO — Fujitsu Ltd. has announced its intention to break into

the communications marketplace with a value-added network equipment. The company's scheme calls for the construction of a new headquarters building equipped with a 6.3M bit/sec digital network and office automation system that simultaneously handles telephone, data and image communications processing. Fujitsu eventually will offer the value-added network service as one of its commercial products, according to a spokesman.

TOKYO — Japan's Institute of Office Automation has released the results of its third survey on office automation. The study indicated that office automation has cut companies' operating costs by an average of 7.5% and personnel needs by 6.6%. However, 62% of the companies surveyed

claimed to have trouble estimating the true effect of office automation on the productivity of their employees.

TOKYO — Japan's computer-aided design and manufacturing (CAD/CAM) market grew to \$632 million in 1983, according to a recent report from International Data Corp. called "EDP Japan Report." The study also revealed that the average cost per workstation dropped by more than 60%, down to approximately \$27,000. Major trends that were charted in the study include: users are moving from two- to three-dimensional applications; turnkey systems are migrating from 16-bit to 32-bit processors; and U.S. CAD/CAM suppliers are losing ground to Japanese manufacturers of CAD/CAM peripherals.

Court delivers two convictions in export trial

BOSTON — A New York air cargo forwarding firm and its former general manager have been convicted in federal court here of shipping semiconductor manufacturing equipment to Hungary using a false export declaration.

They were acquitted, however, on two counts of violating federal trade restrictions against Eastern bloc nations and on two counts of filing false export declarations.

The government had accused the cargo forwarding firm, Airfo International, Inc., of shipping a \$600,000 GCA Corp. semiconductor manufacturing machine, the Mann 4900 Direct Step-On Wafer System, to Budapest in 1982 (CW, Oct. 24).

The machine was then the most advanced of its kind, Assistant U.S. Attorney Dennis Kelley said, explaining that it could be used to produce semiconductors for use in telecommunications, radar devices, missiles and Multiple Independently Targetable Reentry Vehicle (MIRV) warheads.

Shangraw continued

Also convicted of filing a false export declaration with the U.S. Customs Service was Michael A. Kollesch, Airfo International's general manager at the time of the incident. Kollesch, who will be sentenced May 18, faces maximum penalties of five years imprisonment and/or a \$10,000 fine.

The semiconductor manufacturing machine had been ordered from GCA by Joseph P. M. D'Haena, who claimed it would be used by an Antwerp, Belgium, technical college, according to Kelley. The equipment was then shipped by Airfo International not to Belgium, but to Budapest via Zurich.

D'Haena, a Belgian national, is being prosecuted by the Belgian government for his alleged part in the conspiracy, Kelley said, and is currently free on bail there.

A spokesman for GCA said the wafer step-on machine produces integrated circuits by reducing by five or 10 times the chip's pattern and projecting it onto a silicon chip as part of the chip's etching process.

Something very powerful just broke out

Introducing the Prime 2550 for office installation.

This is the kind of power and performance you usually find locked away in a computer room.

A virtual memory system with the ability to handle concurrent batch and interactive operations with ease. And supporting up to 64 on-line users with 32 Mb of program space available to each.

The difference is, the Prime 2550 doesn't need a computer room. It doesn't need special air condi-

tioning. Or a raised floor. Or a dedicated staff to keep it running.

So you can put it where you really need it. Right in the actual working environment. And you'll still be able to share data with other systems, thanks to Prime's advanced networking software and communications with your mainframe.

The 2550 is ready to run more than 1,000

NEWS

European antitrust case against IBM still on books

By Russ Braggner
Special to CW

AMSTERDAM — The European Economic Commission (EEC) concluded back in February of 1972 that IBM had broken several provisions of the Treaty of Rome, the 1957 doctrine outlining fair business practices in Europe. The EEC began using the words "dominant position" to describe IBM's European presence.

The European legal battle is still very much alive despite the U.S. government's 1983 dismissal of its 15-year-old antitrust suit against IBM. Frans Andriessen, the Dutch EEC commissioner responsible for policy on fair competition, told *Computer-*

world Reviewer in a recent interview. He estimated that the European suit is still "several years" away from being resolved.

Andriessen recounted how in 1972 the EEC Directorate of Industrial, Technological and Scientific Affairs initiated an informal inquiry into the European DP suit, shortly thereafter, concluded that IBM had breached the Treaty of Rome in its business practices. As a result, the EEC launched a formal investigation into IBM trade practices.

The investigation took the form of an extensive mail survey of IBM users and IBM competitors. The EEC also requested documents from IBM

covering various aspects of the DP industry in general and IBM's policies and practices in particular.

One of the key parts of the case became the definition of "the relevant market." IBM recommended that the EEC conduct a formal census of the DP industry similar to that ordered by the Federal District Court in the U.S. The EEC declined, choosing instead to rely on its own information sources, which, according to IBM, were inaccurate and unreliable.

On Dec. 10, 1980, the EEC issued a "Statement of Objections" against IBM. In the statement, consisting of a 360-page complaint and two volumes of appendices totaling more than

1,000 pages, the EEC charged that IBM held "a dominant position in the relevant market," a market characterized by:

■ IBM systems and systems from IBM plug-compatible manufacturers (PCMs).

■ Basic system software that runs on these CPUs.

■ IBM's practice of not disclosing "interface information," making competition very hard for the PCMs.

IBM delivered its defense on Aug. 31, 1981, claiming that it was not dominant in the market and that the European DP market was big enough to accommodate fair competition. The company contended that its business practices were fair.

In December 1981 — one month before the U.S. case was dropped — IBM's then-Chairman Frank Cary, along with top IBM lawyer Nicholas Katzenbach, offered a compromise plan to the EEC, based on the premise that a dismantled IBM in Europe would mean an open door for the Japanese computer industry.

In February 1982, after formal hearings began, the EEC rejected the plan and responded with four specific complaints against IBM:

■ That it had bundled basic software without a separate charge.

■ That it had bundled a minimum of main memory with the CPU (the commission proposed that IBM charge a separate price for the main memory and offer a CPU without main memory).

■ That IBM had failed to disclose interface information, preventing competition for a certain lead time.

■ That IBM had failed to make available the systems' Installation Productivity Options (IPO), which made it possible to install IBM software on competitors' machines.

The first and fourth complaints were dropped a year later.

At first, IBM told the commission that it had misunderstood the nature of the IPOs. In effect, they represented — in packaged form — part of the services provided by the IBM system engineers; they are not unique software products. Recently, however, IBM announced for its newest MVS/XA release a similar strategy called Custom Built Installation Productivity Options, and so far nobody has challenged this strategy.

The specific charges still to be resolved are the issues of interface information and the bundling of a minimum memory with a CPU.

The general feeling in the industry is that a compromise between IBM and the EEC is in sight.

Will there be a resolution in 1984? "No comment" is the word from both IBM and the EEC. One of the issues pleaded the EEC is that IBM employs 100,000 people in Europe and generates revenues of about \$10 billion.

Some industry analysts speculated that all parties may decide to let bygones be bygones and forget the case for the time being. They noted that the people with the biggest gripes — the plug-compatible vendors — do not have a very strong position in Europe.

Braggner is a senior editor at *Computerworld* Research, *Computerworld's* Dutch subsidiary. The article was made available via the *CW International News Network*.

of the computer room.

application packages. From CAD/CAM to data base management to office automation. It's fully compatible—in both hardware and software—with the entire family of Prime 90 Series computers. And it comes with the worldwide service and support of a Fortune 500 company.

The new Prime 2550. Now you really have the power to go places.

For details, call 1 800 343-3540 (in Massachusetts 1 800 322-3459). Or write: Prime Computer, MS 15-60, Prime Park, Natick, MA 01900.

PRIME
Computer

IBM® is a registered trademark of International Business Machines Corporation. Prime 90 Series is a trademark of Prime Computer, Inc., Natick, MA.

NEWS

Computer break-in produces guilty plea

NEW YORK — The former law firm employee who was charged with breaking into his employer's restricted computer files to gain knowledge of secret corporate acquisition plans has pleaded guilty to a two-count federal charge of conspiracy to commit securities and mail fraud.

Steven M. Crow, a former word processing employee of Skadden, Arps, Slate, Meagher and Flom, had been accused of passing on the confidential information to several others, including stockbroker Aaron L. Lerman, who is alleged to have used the information to make profits in stock trading (CW, April 9). Those profits were allegedly shared with Crow and

Alfred Salvatore, a former proofreader with the law firm, according to Assistant U.S. Attorney Andrew J. Levander, who is in charge of the investigation. Lerman and Salvatore also have been charged with conspiracy to commit securities and mail fraud.

According to Levander, Crow would often work evenings using the law firm's word processing system to access the Skadden, Arps computer, where the files were stored. He had cracked the code that encrypted the files, Levander said, and would search the files for signs of corporate takeovers.

Among those tender offers and ac-

quisition plans said to have been misappropriated were Kelo and Co.'s bid for U.S. Industries, Inc.; Ben-Nore-co, Inc.'s bid for American Plan Corp.; Gulf Broadcasting Co.'s bid for Concord Corp.; and Enmar Oil Corp.'s bid for Midlands Energy Co.

Crow faces a maximum sentence of 10 years' imprisonment and \$11,000 in fines, Levander said.

The charges against the trio capped a year-long investigation by the Securities and Exchange Commission, which had been instigated by the law firm. Levander said that the investigation in the case is continuing, but would not say whether further charges were expected.



MANAGING ON
THE MOVE

ROBERT E. JOHNSTON has been named director of data processing systems and an officer of Phoenix Mutual Life Insurance Co. in Hartford, Conn.

Johnston is responsible for the development and maintenance of the firm's Business Reinsurance Plan as well as procedures, hardware and software to enhance the company's physical and data security program.

Prior to joining Phoenix Mutual in 1981, Johnston was manager of data processing security at the Hartford Insurance Group.

VAKIL P. KUNER has been appointed vice-president of management information services at Network 1, Inc. Network 1 is a discount long-distance telephone company in Hollywood, Fla., where Kuner will be responsible for all computer operations, systems planning, development and implementation.

Prior to joining Network 1, Kuner was president of his own firm, a consulting service to the resale telephone industry.

He has also served as vice-president for the OEM minicomputer division at Anderson Harman Computing Services. Kuner was president for more than 10 years of Connective, Inc., a custom software development consultancy to local governments and research firms.

He holds an A.B. in architecture and a master's in city planning, both from the University of Pennsylvania.

JACOB J. NICHODEM has accepted the position of manager of information systems at the Jemp Division of ITT Rayonier, Inc. in Jemp, Ga. He will be responsible for planning, implementing and controlling systems and data processing information services for the Jemp Division and coordinating the division's systems with corporate systems.

Nichodem comes to ITT Rayonier from FPG Industries, Inc. of New Martinsville, W. Va., where he served as data processing manager for the past five years. Prior to that, he was employed by FPG in Pittsburgh for eight years and by IBM in Pittsburgh for five years.

He holds a degree in electrical engineering from West Virginia University.



Nichodem

Suddenly everyone's advertising WALKER-like financial software.

Headline:
"Most Satisfactory System." All Copy-Righted. But here of the... makes it look not true.

Subhead:
"Most Advanced System." Re-named everything New! marketing in all ad take... that and a few more left over.

Body Copy:
Start seeing the team. "Fully Integrated System." (After all, we do have a common guy language.)

Copy Print:
Claim a hold on "future technology" because of the flashy font and we billed on.

The Kitchen:
We can clinch the deal if we say that we're hooked to a D.B.M.S. Mention "youth generation" anything.

Conclusion:
They always cut these out and send them in. Just send the same old information.

Frankly, we're flattered.

Now that all financial software looks like the Walker's, maybe you should look at Walker, too. Our innovative financial, purchasing and material management systems have become an overnight success because they were built from scratch with the features that today's sophisticated buyer demands:

- Real time — fully interactive for superior user responsiveness.
- Integrated — data, transaction, and user-interface levels.
- Flexible — Walker Personalizes give PC-like ease-of-use and personal control to sophisticated, powerful mainframe systems.
- High tech — comprehensive, full-feature use of CICS, VSAM, IMS DB/DC, COBOL DB/DC, ADABAS, Com-plate and DATACOM DB/DC.

If you like what you've been seeing in all the ads, then give Walker a call for a free demonstration. Because no matter what those other ads say, there's nothing quite like the real thing. And you can own one today.

WALKER

100 Mission Street, San Francisco, California 94105, (415) 492-6637

Meet to eye 8100

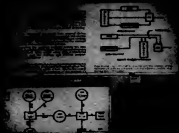
NEW YORK — The third meeting of the recently founded IBM 8100 Users Group is scheduled for June 12 at a location to be announced.

Founded in January as a forum for users of the IBM 8100 and its software, the group now has a membership of 70 corporations.

Reservations can be made with Jo Ann Klein, Room 481, Consolidated Edison, 4 Irving Place, New York, N.Y. 10003.

The Star of Team Xerox.

XEROX



The Star 8010 professional workstation has always been known as a computer of dazzling capabilities, especially in its graphics, information processing and document preparation.

Team Xerox But what some people may not know is that the Star is also the key element in Team Xerox, a system of office machines designed to work together like a team.

When part of an Ethernet network, the Star can work with a wide array of word processors, mainframes, personal and business computers, printers, electronic mail and

file services, facsimile terminals, communicating Memorywriters, other networks and, of course, other Stars. It also provides 3270 and TTY emulation.

Its full 17" bit-mapped screen lets you view two full pages simultaneously and open up to six documents at a time without covering up a previous document.

It's also the only workstation that can create and print documents in more than a dozen languages, including Russian and, for the first time, Japanese (Katakana, Hiragana and Kanji).

While other workstations may use Xerox

innovations like the mouse, icons, windows, property sheets and combined text and graphics, the Star simply does more with them.

For example, the Star's extensive software is fully integrated, to allow you to work with text and graphics simultaneously. You can draw a flowchart right in the middle of a full page of text without having to resort to a separate program and limited buffer "scratchpad" or "clipboard."

In terms of capabilities, ease of use and overall value, the Star would have to be considered the stellar workstation in the industry.



**You have the information.
We have the way to move it.**

Now, Dial-up Telex from ITT! See us at ICA Booth #470.

It's extraordinary how far American business has gone in managing information in the office.

And how frustrating it can be to get that information where it's needed, once it leaves the office.

Your computers, for example, can swap data with each other. But if you need to transmit that data to less sophisticated or incompatible equipment, you can't.

Our Communications Spectrum

It seems clear that something must be done to bring the movement of information outside the office to the same sophisticated level as inside the office.

Improving the movement of that information is only part of what we at ITT are doing now with our Spectrum of Communications Services.

To put it simply, our Spectrum is a range of worldwide communications services. Ranging from telex to high-speed data transmissions.

We've created it specifically to bring together the latest advances in data, record and voice communication.

So, returning to our example, your computers and terminals are now able to talk to other terminals, anywhere in the world. Even those on other networks.

Now throughout the U.S.

You can even deliver the same information to an unlimited number of terminals, automatically.

And we're continually adding new service features to our Spectrum with an eye to satisfying your future requirements.

The way we look at it, whatever other productivity problems American business has, it's producing more and more information.

And getting that information where it's needed speedily, reliably, efficiently and economically—that's what ITT's Spectrum of Communications Services is all about.

I'd like more information on ITT's Spectrum of Communications Services.

Name

Title

Company

Address

City State

Zip Phone ()

ITT Dept. A/PR
100 Plaza Drive
Secaucus, NJ 07096
1-800-922-0184

ITT

© 1984 ITT Communications Services Inc.

NEWS

Plant turns to mainframe, not micros, to run spreadsheets

DUBUQUE, Iowa — Like many businesses, FDL Foods, Inc., a meat packaging operation here, saw the benefits that spreadsheet programs offered. "Our accounting department [here] had an IBM Personal Computer, and the Rochelle, Ill., plant had an [Apple Computer, Inc.] Apple II, both running VisiCalc," said Mark Stuch, corporate data processing manager. "We saw productivity improvements there."

But that did not automatically translate into a corporate purchase of microcomputers. "We knew that several departments, such as industrial engineering, could save a lot of time by having an electronic spreadsheet," Stuch said. "However, we did not want to get into microcomputers. We wanted one product that everyone could use."

So FDL Foods began looking for a spreadsheet program to run on its IBM 4341 mainframe. "We searched through a number of publications looking for an IBM mainframe spreadsheet program, but we only found one," Stuch said.

It was Maxicalc, produced by Oxford Software Corp. of Bensbrock Heights, N.J. The DOS/VS version cost FDL \$15,000. To input data, Maxicalc uses IBM 5270 series terminals running in a CICS environment. FDL's mainframe is accessed by corporate offices in Dubuque, Milwaukee and Rochelle.

Stuch and Rochelle.

Before buying Maxicalc, FDL personnel who were experienced VisiCalc users tested the program. The reviews were positive. Now, 25 employees in FDL's three offices use the system.

Maxicalc allows each department to access corporate data. "One of our branch plants can enter cost analysis figures, then our industrial engineering department can call the figures up rather than receive them by mail," Stuch said. "Since the spreadsheet is large, there's enough room to meet everyone's needs."

Maxicalc makes the data processing department's job easier because

"with Maxicalc on our mainframe, we are not concerned with having to set up a communications network between various incompatible microcomputers," Stuch said.

"We know that data is accurate and secure," Stuch said. "I'm the only person who knows all the user IDs and passwords. No unauthorized person can obtain data from another user."

Training has been easily implemented. "Some users are familiar with VisiCalc and already understand spreadsheets," Stuch said. "The manual is very good, and we make it available any time to anyone."

Julie Hancock, cost analyst, had

no computer experience, but she quickly learned how to use Maxicalc. "The tutorial begins at a very low level, reviews all the commands and teaches users how to operate the terminal," Hancock said. "In addition to the users guide, there is also a smaller, hand-size, quick reference guide that I can use when I'm working at the terminal."

Hancock regularly uses Maxicalc. "I enter information daily and compile a weekly report," she said. She collects meat prices, inventory costs and marketing charges, then compares forecasting figures. "Prior to Maxicalc, I had to keep all my records manually."

Videotapes look at MIS future

NAPERVILLE, Ill. — Deltak, Inc. and CW Communications, Inc. have introduced a two-part videotape program series titled "International Data Corp. Computes the Future" in which International Data Corp. (IDC) representatives present their views on issues of MIS management. The program is the latest release in the vendors' Conference Journal Series of computer-related video programs.

In Part One of the series, IDC Vice-President Will Zachman and Tom Wilmet, IDC's director of user research and services, discuss trends and technology in "third-generation" microprocessors, portable systems, user interface options, local-area network standards, new microcomputer software and server key technologies that will affect the future of office automation. Neil Kleinman, IDC's computer graphics specialist, discusses management graphics tools and key products and usage patterns.

Part Two focuses on personal computing. Zachman discusses multiuser systems based on multiple microprocessors and the portable computer market. Zachman also offers his views on the recent AT&T divestiture. John Gasta, editor of Tech Street Journal, discusses both the history and future of computing.

The series is available from Deltak for an average rental of \$60 to \$125 per month, depending on volume. The videos can be purchased for \$160 per course or \$240 for the series.

More information is available from Deltak, East/West Technological Center, 1761 W. Diehl Road, Naperville, Ill. 60563.

CGA Software Products Group, Inc.

TO: ALL SINGLE IMAGE SOFTWARE USERS
FR: CGA TECHNICAL SUPPORT STAFF
RE: MSI ENHANCEMENTS

As many of you started migrating to XA, you discovered that changes were made in VSAM processing in DFP/XA that affect the QNAMES SYSVSAM and SYSIGGV2. These changes have resulted in the need for DFP to be run on all machines—XA and non-XA—in order to maintain a single image link between them.

Seeking a solution to this cumbersome and possibly expensive process, many users called our technical support staff for suggestions.

The result has been Super-MSI V7.3. This interim release supports sharing of these VSAM QNAMES between DFP and non-DFP systems through the MSI option DFPIMPAT. Rental of DFP/370 for non-XA 306X and 430X machines as well as all 303X machines is no longer required to achieve compatibility!

Regardless of your XA migration schedule, this feature of Super-MSI V7.3 will be a useful and cost-saving aid. But, this is not the only enhancement we have to announce. In addition, V7.3 includes our first in a series of enhancements that will make SIS more flexible and easier to use...

OUR CLIENTS WOULDN'T EXPECT

NEWS

Data collection system could save \$1.5 million for shop

Manufacturer tracks machine failure, employee attendance with magnetic wand

NORTH COVE, N.C. — When a piece of manufacturing equipment goes down at Baxter Travenol Laboratories, Inc.'s largest U.S. production facility here, the operator reaches for a magnetic wand scanner and opens a ring-binder filled with magnetic stripes. He scans stripes that tell the factory's IBM 8100 which machine has failed and why. Alerted by the computer, repairmen are soon on the spot, and the machine's failure is permanently recorded.

The North Cove facility's shop floor data collection

system also records employee attendance information and soon will be keeping track of inventory in a section of the plant where workers will use the scanning wands to report production. In all, the system could save \$1.5 million for Baxter Travenol, a maker of health care products with \$1.7 billion in annual sales, according to Richard Proszowski, one of the firm's project leaders.

The North Cove plant is the only one among the firm's nine national and 17 foreign facilities to use such an extensive data collection

scheme. Like plants run by the firm in Singapore, Australia and Arkansas, the North Cove facility has an IBM System/38 host computer for on-site data processing.

But only the System/38 at the North Cove plant can turn to the data collected by the IBM 8100 system for a trend analysis of such questions as "Which of the plant's machines are regularly breaking down and why?" In all, 160 IBM 3640 and 3647 terminals link into the two IBM 8100 processors that form the heart of the data collection system. The IBM 3640s receive information via the magnetic wands near the plant's machinery, and the 3647s serve as electronic time clocks for the plant's roughly 2,400 hourly employees.

Magnetic badges

Employees clock in and out by inserting magnetic badges into the terminal's slot reader, and the IBM 8100 provides the data to their supervisors.

"Minutes after a shift has started, a supervisor can see who is available and begin reassigning workers as needed," explained Steve Wettler, assistant to the North Cove plant's manager. "Charging labor to the proper department and job is accomplished automatically."

Prior to introduction of the on-line data collection system, the plant had, like all of the company's System/38-based facilities, collected employee attendance and machine downtime data manually. But that system was too slow. "Some products remain in our plant for less than a shift," explained plant manager Ed Oglesby. "To act on problems, we need information that is no more than an hour or so old."

In 1981, the firm called in an IBM Applications Transfer Team to study the plant's requirements. Working together, the team and the plant's management developed a system that has since been very good, Proszowski said. Originally, he noted, a

system that would send the factory's data to the mainframe computer at the firm's Deerfield, Ill., headquarters had been considered, but the idea was discarded in favor of "giving the plant control of the process."

Baxter Travenol developed the software for the data collection system, Proszowski said, but received extensive help from IBM, including review of the data base design and modeling of the entire process. The com-

pany is currently working to implement an inventory control system at the North Cove plant, also using scanning technology. When the full data collection system is on-line at North Cove, he said, the projected savings of \$1.5 million should be achieved. The savings will come from a reduction in conversion loss, improved work-in-process inventory control, reduced work-in-process inventory levels and greater labor accountability.

COMPUTER MARKETING EXECUTIVES

Qualified leads cost you less
than \$25 each, delivered to
your showroom at:

COMPUTER TECHNOLOGY CENTER

CALL US TODAY

SAMPLE SHOWROOM NOW OPEN

1605 W Olympic Blvd., Los Angeles, CA 90016 • (213) 396-8118

ANNOUNCING

FLASH!

- ENHANCES OUTPUT RETRIEVAL USING SPY/SPY
- MENU SELECTION TO VIEW, DELETE, AND REQUEUE JOBS ON JES SPOOL
- USES SPY/SPY BROWSE DIRECTLY AGAINST JOBS IN JES SPOOL
- 10 - 20 TIMES FASTER RETRIEVAL THAN SPY 3.6
- WORKS WITH HELD OR NON - HELD DATABASES
- ALLOWS DISPLAY OF SYSLOG
- IBM MVS OR MVS/XA WITH JES2 OR JES3
- FULLY SUPPORTED

TONE

Software Corp.



SPECIAL PRICES IN EFFECT
FREE 30 DAY TRIAL
JES 2 FPL \$2500
12 MONTH LEASE \$699/MO
JES 3 FPL \$5500
12 MONTH LEASE \$194/MO

1781 Broadway (714) 991-0666
Redwood, CA 94068 Telex 1917

AT AT&T, WE TEACH UNIX[®] OPERATING SYSTEMS AS IF WE INVENTED THEM.

Announcing
training from the
creators of the
UNIX Operating Systems.

Now everyone can get top quality UNIX Operating Systems training from the people who created them—AT&T Bell Laboratories. Along with our certified instructors, we offer a complete curriculum for UNIX Operating Systems, including UNIX System V.

These courses are the same as those conducted internally at AT&T Bell Laboratories. And we furnish them at your location or at one of our conveniently located centers: Princeton, N.J.; Chicago, Ill.; Columbus, Ohio; and Sunnyvale, California. We provide an individual terminal for each student. And in the evening, the use of our facilities and terminals is available at no extra cost. In addition, volume discounts are available.

All UNIX Operating Systems courses are designed and developed to high quality standards by AT&T, as part of a total commitment to UNIX Operating Systems support. Now with our training, you can learn firsthand, what everyone else has been teaching secondhand.

For information, call us at 800-221-1647 or write to AT&T, P.O. Box 2000, Hopewell, NJ 08525.



Seahawks' system ready for draft pick tomorrow

KIRKLAND, Wash. — When the Seattle Seahawks get ready to make their picks in the National Football League draft tomorrow, their front office expects no repeat of the computer traffic jam it has experienced during the past few drafts.

Last year, the combination of scouting report work and fan seating changes in the 64,874-capacity Kingdome was jamming the team's minicomputer, a 1938M-byte Datapoint Corp. 6600 processor. Terminal operators often experienced annoying waits while information took its time coming up on their screens.

"When you get them both going at the same time, it really slows down screen response time," Seahawks DP Director Tom Monroe said of the scouting work and seating changes. "At this time of year, no one wants to wait."

Scouting activity is heavy around draft time. Tomorrow, the Seahawks hope to make choices that will help improve on their 1983 9-7 record, which earned them a wild-card berth in the NFL playoffs. The team beat both Denver and Miami before losing to the Los Angeles Raiders, the current Super Bowl champions.

Not bad for a team that played its first full season in 1976 and that first began in-house data processing in 1979, perhaps only the third NFL team to do so, Monroe said. In its first three years, the team employed an outside service bureau that used Datapoint equipment, and many of the team's programs were written in Database, Datapoint's business-oriented programming language. "The service bureau handled applications which involved mostly mail list maintenance," Monroe said.

The team bought its 6600 in 1979. When the time was right to upgrade from the stand-alone system after last year's draft, the Seahawks again decided to stick with Datapoint. It installed the Attached Resource Computer (ARC) local-area net-



President and General Manager of the Seattle Seahawks Mike McCormack oversees the franchise's day-to-day operations at the team's office and practice complex, located on the shores of Lake Washington.

work in its 20,000 sq-ft office and practice complex on the shores of Lake Washington. With an added 60M bytes of memory, the local-area network was intended to speed response time.

"We didn't really replace any hardware, we just bought more hardware," Monroe said. "We immediately began utilizing the programs which had been developed at the service bureau. It made for a very smooth transition."

The Seahawks now have one 6600 processor with 180M bytes of disk storage, two 6600 application processors, two 3860 desktop computers, 15 terminals (8200c and 8600c) and two printers. The network makes all system resources available as if they were locally connected to each user workstation.

Applications have grown along with the system.

The Seahawks now use programs in five specific areas: ticketing, college scouting, professional scouting, coaching and public relations.

Ticketing applications involve the tracking of all season ticket holders, seat locations, payments and requests for seat improvements. This program also tracks current mail-order ticket holders and individual game ticket purchases.

In the college scouting application, the Seahawks obtain information on college athletes through a scouting "combine." Seattle's combine includes Dallas, Duffalo and San Francisco. Each team in the combine has a scout who reports college football activity for specific areas.

The cumulative information is summarized and input into each team's system. "Each team analyzes and interprets the information in its own way," Monroe said. "Only the reports are duplicated; how each team analyzes the information and what it does with its findings are completely individual."

As for pro scouting, the Seahawks' ARC network allows management to keep a brief history of each pro player and his current status. If a player is hurt, the coaching staff knows where to look for a replacement.

In addition, the ARC network is useful during the Seahawks' training camp, which is located in Cheney, Wash., 850 miles from the team's office and practice complex. "We place a terminal at the training camp during the summer so that we can keep track of the movement of players — there are so many players cut and signed during this period," Monroe noted.

Other functions of the system involve the compilation and printing of coaching reports. This information allows the Seahawks to analyze their opponents' offense and defense and to predict the tendencies of opposing teams.

TELLAPLAN™ MAKES EASY AS

Now, anyone in any department can easily manage projects and events. And they can graphically communicate results to top management.

How? With TELLAPLAN™ software from ISSCO.

Thanks to TELLAPLAN, you don't need to know elaborate planning techniques or computer programming. Using simple English commands, you can build

detailed plans, set time schedules, figure labor loading and compute budgets. You can quickly make updates, add new tasks and adjust timing, too.

Complete planning capability.

TELLAPLAN works with ISSCO's

TELL-A-GRAF® graphics software.

Together, they produce a wide variety of Gantt charts that combine features of PERT and CPM with Gantt simplicity.

You can see planned, actual and estimated start and end dates, as well as critical paths, task dependencies and slack. In addition, TELLAPLAN produces more than 50 resource and cost reporting charts directly from the planning data.

TELLAPLAN also lets you do "What if?" analysis. It automatically computes critical paths between tasks every

Jeweler cuts credit losses with automated system

DALLAS — When hard economic times forced more credit buying and increased bad debt risks, a jewelry store chain based here reacted with a collections system that it said helped cut bad debt losses by up to 80%.

Zale Corp., an international retailer, felt the effects of harsh economic conditions on luxury and specialty sales and saw a corresponding increase in credit purchasing. With 1,600 retail stores in the U.S. and abroad, catalog showrooms, leased jewelry operations in department stores, gift shops and a direct-mail merchandising division, the company recognized bad debt as an unavoidable cost of doing business in a credit-based economy.

Zale formed a wholly owned subsidiary, Jeweler's Financial Services, Inc., to manage its credit receivables. That group instituted a new account solicitation program, tightened credit approval standards and examined the weaknesses of its predominantly manual collection department.

In 1982, a management team concluded that the firm's 850 collection employees worked in a system that was cumbersome and often ineffective. Bad debt was cutting into a profit margin already endangered by temporarily falling sales.

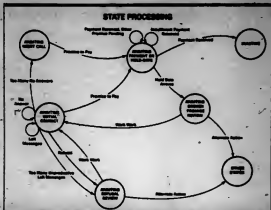
The company opened nine regional collection centers from which

collectors telephoned delinquent debtors, sent dunning letters and noted their results on preprinted cards that were filed for follow-up. The management team found that the process of updating and circulating accounts was time-consuming and often fell behind schedule, forcing collectors to work with old or inaccurate information. The paperwork required complex clerical procedures and considerable storage space.

Management decided to search for a computerized system that could be adjusted to the company's special needs. "We looked for a long time before we finally plumped. We examined systems in operation at 11 companies before we settled on the American Management Systems, Inc. Computer Assisted Collection System (CACS)," said Tom McCollum, vice-president for Jeweler's Financial Services' technology and administration division.

McCollum noted that Cacs provided a superstructure that could be modified for his company's needs. "It's an exceptional improvement over our old collection process, and we are now getting better results with half our former staff," added Randy Levy, president of Jeweler's Financial Services.

Cacs has been operational since last April on Zale's BIR 3061 main-



The Computer-Assisted Collection System groups delinquent accounts into "states" with other accounts in similar conditions. For example, an account that becomes delinquent is assigned to the state "Waiting for Initial Contact." If the customer promises to pay a certain amount when a collector phones to request payment, a future "hold date" is set, and the account is routed to the "Awaiting Payment or Hold Date" state.

frames. During the transition from the manual to the automated system, preprinted collection cards were re-formatted to display information to collectors in the same manner they would later see it on their screens. In addition, Jeweler's Financial Services produced an intensive video training program and workbook.

The company trained 400 people

on the system, with most collectors feeling comfortable with the operation after two days of training, Zale said. Now Cacs handles between 50,000 and 60,000 accounts at a given time and automatically routes cases on a priority basis.

Cacs are brought up automatically by each day, with collectors first

See ZALS page 28

MANAGING PROJECTS A, B, SEE.

time a plan is updated. And it calculates current earned value.

Best of all, when you're ready to share your data with others, TELLAPLAN's bold, clear graphics ensure that your presentation will look professional and be easily understood.

Free project management guide.

Let ISSCO show you how TELLAPLAN can work with your company's

mainframe or 32-bit minicomputers.

To receive a free copy of our booklet, "How to Plan Projects and Keep Them on Schedule" call (619) 452-0170. Or write to ISSCO, 10506 Sorrento Valley Road, San Diego, CA 92121. We'll help you make managing projects easy as A, B, See.

DRAW FASTER CONCLUSIONS WITH ISSCO.

ISSCO
GRAPHICS SOFTWARE



NEWS

System frees trading house from service bureau delays

In-house DP gives traders an edge on multimillion-dollar accounts

CHICAGO — By converting from a batch processing service bureau to an interactive mainframe system, a trading house here said it was able to cut expenses and provide its customers with more timely information.

Sharpe Trading Systems, Inc. was paying close to \$750,000 a year to a service bureau that each morning supplied a brokerage report. "Traders and risk managers used the report to advise their clients and track accounts," explained Rick Sharpe, president of Sharpe Trading Systems. To gain an edge on the competition, traders and risk managers were

rising at dawn to analyze the report and determine strategy. Often, late afternoon transactions from the previous day were not included in the report, so strategy and analysis were often based on dated information. Sharpe decided to write an on-line trading system that could provide more accurate information and alleviate the early morning blues.

The company was using an IBM System/38 processor, but needed a flexible communications package for its system. "We looked at a number of protocol converters," Sharpe said. "But they did not have the flexibility

we needed. Some of our traders were using IBM Personal Computers; others worked with Texas Instruments, Inc. Silent 700 terminals. So, we needed a communications package that worked with both places of equipment."

The trading firm chose Access/38, a communications package from Access Telecom, also based in Chicago. "Access/38 allowed us to use existing equipment," Sharpe said. "The product could handle all protocols, had well-designed host support and was easy to use." Sharpe paid \$15,000 for the communications package.

Sharpe's system was completed last year and has provided benefits to employees and customers. "Our traders and risk managers can now review trading data at home each night," Sharpe said. "They are also able to generate reports on personal computers by downloading files from the host system."

Of Sharpe's 300 traders, 60 to 70 use the system daily. "Because we provide on-line information, our traders are able to attract a number of customers who may have turned to another system," Sharpe said. "There is a great deal of money at stake — sometimes as much as \$10 million to \$20 million in one account. We have realized tremendous cost savings."

Sharpe is offering to other trading houses a system that uses its software and Access/38. "A typical configuration could cost approximately \$500,000, including the hardware," Sharpe said. "I estimate that a company could make that money back in six to nine months."

Introducing. Software for the operations manager.

The automated
DOS VSE
data center

ZALE

from page 37

working on the accounts with the most negative impact on cash flow. Depending on the collectors' success, these accounts are automatically scheduled for follow-up according to priority.

The display screens contain some information unique to Zale, but the program is designed to display general collection information, such as the number of telephone calls made, the dates letters are sent, the dates of payments or promises of payment, the available credit, the delinquent amounts and the best place and time to contact the customer.

Jewell's Financial Services uses two screen formats, one for general collection activities and one for "skip tracing" customers. The skip-tracing screens contain more detailed information about seriously delinquent accounts, including total credit records. Use of the second screen nearly eliminated the extensive file rooms previously used by collectors working on skip tracing.

Management also uses Cacs to judge individual collector performance. Recording the results of conversations with customers, the number of accounts moved to current status and the number of promises kept allows management to evaluate collection strategies.

In the first four months of the system's operation, collector productivity increased 100%, Lively said. One regional center increased customer contacts by 54%, decreased delinquency by 40%, cut losses by 50% and reduced staff by 56%.

Zale added, "What we've accomplished has suddenly opened up an entire horizon of information that we never had before. There is almost no limit to what we can do. I would recommend an automated system to any company with collection activities." He reported that the only problems the company had with the system involved making its own modifications.

"The system will pay for itself in 15 months. We have well exceeded our original expectations," he said.

The Philips 3000 Series. Future Included.

Building Blocks. The 3000 Series universal workstations. The vital building blocks in the Philips Information Systems Office Automation strategy. A strategy that assures you today's purchase won't become obsolete in the years ahead. We include the future by providing a migration path from electronic workstations, upward and outward to distributed processing, sophisticated local area networks, and beyond.

Versatility. The 3000 Series includes award-winning* word processing software recognized for ease of use and versatility. Each 3000 Series workstation functions as a word processor, a desktop computer using off-the-shelf programs, and a sophisticated telecommunications terminal including Miconet for Philips-to-Philips electronic mail, as well as asynch, bisynch, and 3276 emulation.

Resources. Our parent, N.V. Philips, a 16-billion-dollar multinational corporation, is the third largest corporation specializing in communications and electronics with 200 factories in over 100 countries and 300,000 employees worldwide.

We put the power of over one billion dollars in research behind our Office Automation systems. Technological firsts, from the original cassette recorder to the video-disc and digital optical recorder allow us to expand our Office Automation strategy in the future, while keeping compatibility intact.

Support. All products in the Philips Office Automation strategy are backed with an extensive guarantee and comprehensive user training and service.

To find out more about making our 3000 Series the building block in your Office Automation future, call toll free 1-800-828-6211. In New York State 1-800-462-6432. Or, send the coupon below.

Helping you solve the mysteries of Office Automation.

**PHILIPS
INFORMATION
SYSTEMS**
PHILIPS

Alexander Fichtenick
The World's Foremost Office
Automation Problem Solver.



**Philips products are consistently rated at the top of the DualPro User Survey.*

You Philips I want to make your 3000 Series the building block in my Office Automation future.

Please send me further information on your Office Automation strategy.

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Mail to: Philips Information Systems, Inc., Marketing Services,
6040 McAllen, Dallas, TX 75244

CW 0430

NEWS

Government goes on-line to access financial data

ST. JOHN'S, Nfld. — To access financial information, a local government has implemented three on-line systems in two months and trained 300 users to utilize the systems.

Record keeping for funds was becoming a problem for the Government of Newfoundland and Labrador's Finance department. The volume of information that had to be processed was fast outgrowing the bookkeeping system, which required 15,000 magnetic ledger cards for individual postings.

"Our people couldn't access the right financial information or get the type of breakdowns they needed," said Bernard Carver, comptroller general for the provincial government.

"And with the volume growing each day, it was getting more and more difficult to keep up the pace." Moreover, Carver's department was having mechanical problems with the bookkeeping system.

The search for a solution started with the help of Newfoundland and Labrador Computer Services Ltd., an independent local service. Looking at several software companies, an evaluation team narrowed the choice to four. From these, Director of Government Accounting Ian Cowan's group selected three applications software systems — general ledger, accounts payable and budgetary control — from Management Science America, Inc. (MSA) in August 1983.

According to Glen Stokes, director

of systems development for the government, most of the planning was done up-front. With the help of the finance department, Computer Services weighed the resources they needed against the personnel on hand, then set up a schedule to have all three packages implemented by April 1, 1984.

They determined that three project teams were necessary for implementation. Headed by Tony Bristow, a project supervisor for Computer Services, the data processing team included six people from Computer Services who concentrated strictly on the systems' technical functions. The second team, led by Robert Harnum, manager of payment processing and systems operations, dealt with procedures in governmental accounting and any changes needed in forms or operations. Harnum's team was also responsible for keeping the old system running while the new one was brought in.

Six representatives from various government departments made up the third team, which was headed by Florence Delaney, management analyst. Their job was to convert the account centers of 18 departments to the new systems, change the chart of accounts and take care of financial reporting.

The project leaders attended train-

ing classes to learn about their new systems and worked with the government accounting division to determine the policies and options they were going to use. Then they returned to their individual teams.

While the project teams worked on the implementation, the government made sure all potential users got the training they needed. With the help of Newfoundland's Public Service Commission, 300 people were trained in two months.

On April 1, 1984, the three on-line systems were implemented. The old and new systems were run in parallel until the end of June.

Delaney's group found the new system had a positive impact on voucher processing. "Now, departments use the on-line capabilities to find out if an invoice has been paid," Delaney said. "Because the old system provided information at the voucher level, it was difficult to find the detail on invoice gives."

Harnum added that the new software also provides a control summary for each item the government is responsible for. "We never had this type of information before. Now, when the public works and services department goes through its routine maintenance of 1,000 public works buildings, they have better control of funds."

Office show set for Vancouver

VANCOUVER, B.C. — The Pacific Automated Office Exhibition, which its managers said will be the first major event of its kind in western Canada, will be held Nov. 29-30 in the domed B.C. Place Stadium here.

Wang Laboratories, Inc.; Xerox Corp.; Canon U.S.A.; Kodak Corp.; and Olivetti Corp. will be among the exhibitors. Some companies are booking up to 1,800 square feet each, said a spokesman for Traccon Exhibitions,

managers of the show.

The exhibit will feature an "Ultimate Office" display of state-of-the-art equipment and seminars on a variety of topics.

The registration fee for the Pacific Automated Office Exhibition seminar program is \$275 for all three days. More information about the show is available from Traccon Exhibitions, Suite 202, 636 W. 10th Ave., Vancouver, B.C., Canada V6Z1K6.



GET YOUR HANDS ON RAMIS II

Benefits on training

- Interactive CPE and interactive CME
- Video training & programs from the start

Three elements in one

- Design & Report writer
- Spreadsheet: P/A creation and calculation
- Database: Advanced file management, EASY, MSA, EASY, EASY, and graphics

Customized

- Free trial use you evaluate source
- No license fee you pay for 100% satisfaction

More information?

- Call 800-368-0077 or 800-368-0077
- Ask us about our training - today!

800-368-0077

I want guaranteed training for me and my staff a meeting of the Credit CREDIT Committee for the Best Use of the Information Center to

Company _____
Name _____
Address _____
City/State/Zip _____
Telephone _____

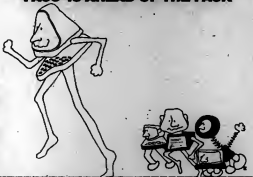
210 W. 10th Ave., Suite 202

Vancouver, B.C. V6Z1K6

CRWTH
The Information Center People

800-368-0077

FOR WAX RESOURCE ACCOUNTING, PACS IS AHEAD OF THE PACK



The competition isn't even close. PACS is so good, it's the only resource accounting package in DEC's™ EAS library. Here's why:

- Flexible billing algorithms
- User budgeting and part speed accounting
- EZLOG™ for true 3-level reporting by account, project and user

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Phone _____

SEND COUPON NOW FOR COMPLETE DETAILS ON ALL THE PACS BENEFITS

SI Signal Technology, Inc.

5911 Enclave Road, Quebec, CA Q2V1T7 (505) 853-3771 (Outside California call toll-free (800) 526-8797)

800-368-0077

and DEC are trademarks of Digital Equipment Corporation

CONW



is available in a variety of flexible growth options. Advanced super bloom can start any today.

1875

1876

1877



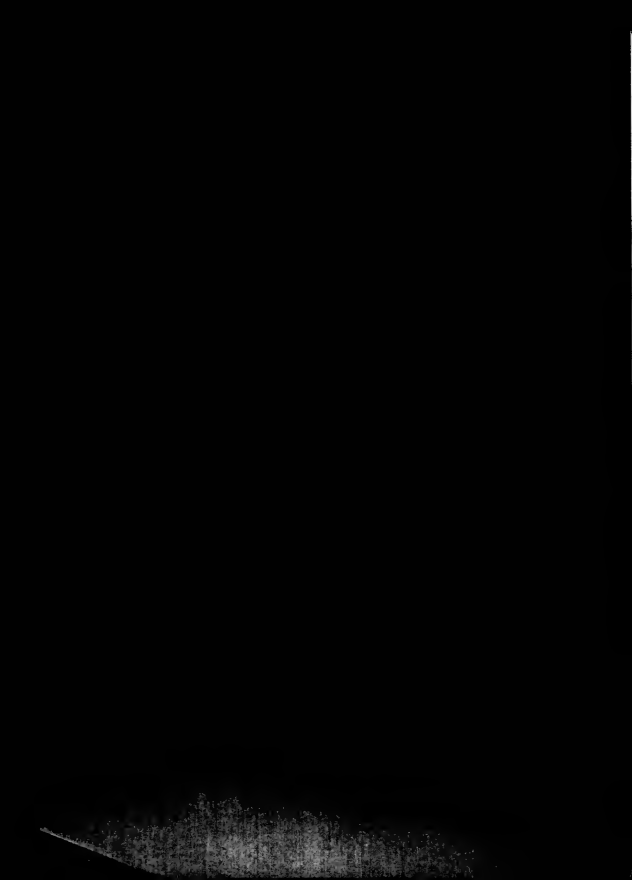
The 3B20S addresses the needs of the 3B family. It's a compact, designed to meet the needs of term, developers, and other applications manufacturing products.

Which a customer can use to build a system you simply add the 3B20S to the 3B20A. And add the 3B20S to your performance. Or use it to build a system serving your needs with the 3B20S.

Or use it to build a system from the 3B20S to the 3B20S. Or use it to build a system possible with only a mod-

ern energy efficient and easy to run without complex and control controls. And unlike most, the 3B20S and the 3B20S are air conditioning or raised





NEWS



CALENDAR

WEEK OF MAY 20

MAY 23-24, CHICAGO — Distribution/Computer Expo '84. Contact: CS Report, Inc., P.O. Box 453, Eton, Pa. 19041.

MAY 23-24, TOKYO — CAD/CAM. Contact: Datagroup, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131.

WEEK OF MAY 27

MAY 29-30, HOUSTON — IBM's Systems Network Architecture: A Master Plan for Teleprocessing. Contact: Datapro Research Corp., 1806 Underwood Blvd., Delran, N.J. 08076.

MAY 29-30, ORLANDO, FLA. — IDMS-DC Transaction Design. Contact: Harris Education Center, 1025 W. Nass Blvd., Melbourne, Fla. 32919.



CALL FOR PAPERS

THE DATA ENTRY MANAGEMENT ASSOCIATION (Dema)

New Orleans, Sept. 14-16

Dema is looking for papers on online processing, ergonomics, microcomputers and data entry, incentive programs, forms design, office automation and data entry, alternatives to traditional data entry, motivation, telecommunications, productivity, data security, word processing and quality assurance.

The deadline for papers is May 21. They should be submitted with a brief autobiographical sketch to Marilyn S. Bodek, Dema, P.O. Box 16711, Stamford, Conn. 06906.

THE PACIFIC TELECOMMUNICATIONS COUNCIL (PTC '84)

Honolulu, Jan. 15-16, 1985

The PTC is interested in papers relating to the technical, business, regulatory, user, social and economic aspects of adapting digital technology to all areas of voice and data communications and broadcasting. Focus should be on Asia, the Pacific and the Americas.

Proposals should be submitted no later than June 30 to PTC '85, Suite 308, 1110 University Ave., Honolulu, Hawaii 96826.

COMPUTER MEASUREMENT GROUP (CMG) INTERNATIONAL CONFERENCE

San Francisco, Dec. 4-7

CMG is interested in papers describing new ideas, new techniques and experiences in computer performance evaluation.

Completed papers are due June 1. Six copies of each paper should be sent to CMG Program Committee, 11242 N. 19th Ave., Phoenix, Ariz. 85028.

MAY 29-31, FORT LAUDERDALE, FLA. — The Fifth International Enterprise Information Systems Forum. Contact: Enterprise Information Systems, Inc., P.O. Box 1154, Greenwich, Conn. 06860.

MAY 29-31, NEW ORLEANS — Gulf Coast Computer & Office Show. Contact: Lori Lierovson, Gulf Coast Computer & Office Show, 119 Avant Garde Circle, Kenner, La. 70062.

MAY 29-JUNE 1, SAN FRANCISCO — The Technical Manager in a Dynamic Environment. Contact: Continuing Education in Engineering, University of California Extension, 2223 Fulton St., Berkeley, Calif. 94730.

MAY 29-JUNE 1, NEW YORK — CHS Application Design. Contact: Syntex, One Park Ave., New York, N.Y. 10016.

MAY 30-31, NEW YORK — Systematic Software Testing. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

MAY 30-31, NEW YORK — Telecommunications Strategic Planning Methodologies. Contact: Marilyn Chastain, The DMW Group, Inc., 3080 Highway Road, Ann Arbor, Mich. 48104.

MAY 30-31, CHICAGO — Managing Projects in the Structured Environment. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

MAY 30-31, NEW YORK — Information Centers. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

MAY 30-31, CARY, N.C. — SAS Color Graphics Course. Contact:

SAS Institute, Inc., P.O. Box 6000, Cary, N.C. 27511.

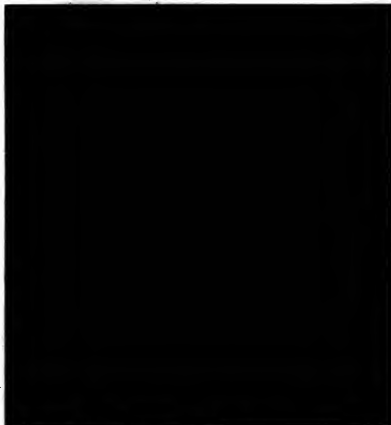
MAY 30-JUNE 1, BOSTON — Data Communications Network Components. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

MAY 30-JUNE 1, DALLAS — Introduction to Telecommunications. Contact: Business Communications Review, 960 York Road, Hinsdale, Ill. 60521.

MAY 30-JUNE 1, DENVER — Data Communications and Networking for Personal Computers. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

MAY 30-JUNE 1, BOSTON — Artificial Intelligence. Contact: Your-

See MW page 48



Have you lost your mind trying to deal with marketing, statistical and demographic data?

May use your strategy with STATMAP by GANESA. With STATMAP you transform dull, hard-to-read data into colorful maps that are easy to analyze, display and present.

Designed for the IBM PC and compatible computers, STATMAP works with your own data and with spreadsheets and data bases. This superior graphics software is unique in its speed, ease of use and ability to map by state, county, zip code, census tract and much more. Memo-

driven, you can learn to use STATMAP in an hour and then produce maps in minutes.

STATMAP's useful "clip and zoom" feature lets you select and enlarge any part of your map. Maps can be conveniently previewed on your monitor, assembled into a slideshow presentation or produced as report-quality graphics by plotter or camera.

STATMAP is an advantage you can afford. For a dealer nearest you, call or write GANESA today. GANESA also offers P.B.G., a presentation and business graphics package featuring population pyramids, bar charts, 3-dimensional pie charts and much more.

Send me more information on STATMAP C and P.B.G. C

Name


Title

Company

Address

City State Zip

Telephone

 GANESA
1449 Chain Bridge Road, Suite 300
McLean, VA 22101
(800) 438-2125 Toll Free
In Virginia: (703) 445-0445

© GANESA, P.B.G. and STATMAP are trademarks of GANESA. GANESA is a trademark of International Business Machines Corp.

NEWS

MAY

don, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

MAY 30-JUNE 1, SAN FRANCISCO — Structured Analysis for Users. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

MAY 30-JUNE 1, LONDON — Duxpe Europe 1984. Contact: Exposition International, Inc., 85 Princeton-Hightstown Road, Princeton Junction, N.J. 08540.

MAY 30-JUNE 1, LAS VEGAS — The Fourth Annual Conference for the Association for Computer Operations Management (Acom). Contact: Acom, Suite 201, 11501 Brookhurst, Garden Grove, Calif. 92640.

MAY 31, NEW YORK — New Communications Strategies: Tech-

nology & Profits. Contact: Link Resources, Inc., 215 Park Ave. S., New York, N.Y. 10003.

MAY 31-JUNE 1, ST. LOUIS — Introduction to Data Processing. Contact: Center for the Study of Data Processing, Campus Box 1141, Washington University, St. Louis, Mo. 63130.

MAY 31-JUNE 1, WELLESLEY, MASS. — The First National Conference on Computer Software Applications in Transportation and Logistics Management for Company Managers. Contact: Beverly Futa, Babson College, Babson Park, Wellesley, Mass. 02157.

MAY 31-JUNE 1, CHICAGO — Negotiating Computer Contracts. Contact: Law & Business, Inc., 757 Third Ave., New York, N.Y. 10017.

WEEK OF JUNE 3

JUNE 3-6, LOS ANGELES — The National Retail Merchants Association (NIRMA) Conference. Contact: NIRMA, 100 W. 31st St., New York, N.Y. 10001.

JUNE 3-6, SAN FRANCISCO — Technology International 1984. Contact: Creative Strategies International, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

JUNE 4-5, LOS ANGELES — Fourth-Generation Data Management Software. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 4-5, CHICAGO — Applications Generators and Fourth-Generation Languages for the IBM World. Contact: Techtran, P.O. Box 10212,

73 Cummings Point Road, Stamford, Conn. 06040.

JUNE 4-5, SAN FRANCISCO — Principles of ADP Project Management. Contact: U.S. Professional Development Institute, ADP Project Management, Department AR, 1830 Elton Road, Silver Spring, Md. 20908.

JUNE 4-5, BOSTON — Micro vs. Mainframe. Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

JUNE 4-5, CHICAGO — Micro/Personal Computer Operating Systems (Unix, Xenix, MS-DOS, CP/M). Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 4-5, PHILADELPHIA — Structured Tuning. Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

JUNE 4-5, NEW YORK — Computer Contracts. Contact: Brandon Consulting Group, Inc., 1775 Broadway, New York, N.Y. 10019.

JUNE 4-5, BOSTON — Facilities for Auditing IBM's DOS/VS Operating System. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JUNE 4-5, PARISPPANY, N.J. — Job Control Language. Contact: Chubb Institute, P.O. Box 348, 8 Sylvan Way, Parsippany, N.J. 07064.

JUNE 4-5, BOSTON — Project Management. Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

JUNE 4-5, DENVER — Data Dictionaries: Concepts, Contents and Use. Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

JUNE 4-5, NEW YORK — Office Automation: Technology and Integration. Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

JUNE 4-5, BOSTON — Data Analysis. Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, 170 Linden St., Wellesley, Mass. 02181.

JUNE 4-5, BOSTON — Auditing & Control Concepts for IMS. Contact: MIS Training Institute, Inc., 4 Brewster Road, Framingham, Mass. 01701.

JUNE 4-7, DETROIT — Robots & Conferences and Exposition. Contact: Robot Institute of America, P.O. Box 950, One SME Drive, Dearborn, Mich. 48121.

JUNE 4-7, BALTIMORE — The Fifth International Conference on Automation and Reprographics in Design Firms. Contact: A/E Systems, P.O. Box 1318, Newtonton, Conn. 06111.

JUNE 4-8, ANAHEIM, CALIF. — Structured Design for Real-Time Systems. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held June 4-8 in Atlanta.

JUNE 4-8, NEW YORK — Vcam. Contact: Syeed, One Park Ave., New York, N.Y. 10016.

JUNE 4-8, MINNEAPOLIS — Structured Programming Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

JUNE 4-8, BOSTON — Structured Analysis and System Specification Workshop. Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036. Also being held June 4-8 in Houston.

A Sure Bet
FOR MICRO/MAINFRAME
COMMUNICATIONS
BLUE LYNX™

BLUE LYNX is the leader in synchronous PC Communications with over 5,000 installations in major corporations.

BLUE LYNX sets the standard for price and performance. Put your chips on a winner.

BLUE LYNX hardware/software packages turn your PC into IBM 3270 and 3271/12 terminals that communicate with Char, 320x, 5/34, 5/36 and 5/38 hosts and allow bi-directional file transfer.

A complete BLUE LYNX package is only \$650.

TECHLAND SYSTEMS INC.
25 WINDFORD PLAZA, NEW YORK, NY 10008
(212) 664-7700 or TELEX 89354

IN DEPTH



DOS/VSE

What VSE/SP 2.1.0 means for users

IBM's VSE/SP 2.1.0 system is a significant announcement, with considerable capability added, but delivery, usage limitations and packaging concerns cloud its value.

By Bennett I. Moyle

On March 20, IBM announced major enhancements to the DOS/VSE control system and related software products, including:

- Virtual address extension to 40M bytes (from 16M bytes).
- New system library structure and facilities.
- Enhancements to ICCF (Interactive Computing and Control Facility) program editor.
- Improvements to VSE/Power spooling.
- IBM Personal Computer support.
- Conditional capability in JCL.
- Interactive menus for both system control and end users.

Availability is scheduled for April 1985.

The most significant enhancement is the long-awaited extension of virtual address space for VSE users. The new system, called VSE/SP 2.1.0, provides for up to three address spaces of 16M bytes each, with a maximum of 40M bytes total. The current limit is one 16M-byte space in Extended Control Program Support (ECPS) mode (4300 CPUs) and 8M bytes in 370-mode operation. The address space limitations have been a problem for even average-size DOS/VSE shops because of the combined virtual storage requirements of VSE control software, including Vtam, CICS and ICCF.

The address space extension has some fairly significant limitations. It cannot run in ECPS

IN DEPTH/ENHANCEMENTS TO DOS/VSE

mode, so 4300 users will have to revert to 370 mode. When the 4300s were announced, ECPS mode was touted as providing a 20% performance benefit over 370 mode; presumably, going back to 370 mode will mean a corresponding loss of throughput.

A large percentage of large VSE users, the ones most likely to need the additional virtual storage, now run VM, in many cases primarily to provide relief for the virtual storage limitation by using multiple VSE systems within one real CPU.

Loss of performance

VSE has an effective linkage with VM that minimizes the VM overhead. However, this performance linkage will only be partially supported when the address extension is en-

For the first time, VSE system source code cannot be ordered. This possibility has been a concern for a long time to system software firms and the many users who modify or tailor the system extensively. It appears to have occurred rather subtly in the packaging of VSE/SP 2.1.0.

played, so users who choose to retain VM will also see loss of performance. An awkward twist is the fate of the large-scale VSE users running 3085 CPUs. These processors only support DOS/VSE when running under VM. Because the processors use a 4K-byte memory page instead of the 2K-byte page used by VSE. For the same reason, VM will not support the extended address space of the new

VSE system. These users simply cannot use the additional address space, even though they are among the most likely candidates for it. There are other limitations in the use of the address space extension that affect its practical use. Use of the IBM DL/I batch-to-CICS interface called Multiple Partition Support (MPS) is permitted only if the batch program and the CICS

are in the same address space.

Because of its size, the production CICS partition is a prime candidate for a separate address space, so the MPS limitation is significant to DL/I users. ICDF has been enhanced to support operation in a CICS MBO (multiple region operation), so that it can be isolated from other CICS users. But MBO is also on the forbidden list for the extended addressability.

Ironically, it seems that the only sites that will be able to use the virtual address extension will be those who don't need it, and they won't be able to do it until April 1985.

Addresses two problems

The new system library addresses two major problems with the current DOS/VSE libraries: dynamic extension of libraries when full, and reuse of space previously occupied by deleted or replaced library members, reducing the need for library reorganization, which tends to be done at the expense of system uptime.

The reuse of space option has a practical limitation in that CICS keeps its own index to programs it has loaded. As a result, it continues to use the former copy of a program when a new version is cataloged, so the former space must not be reused. A 1,024-byte block is used for the new library, which will improve space utilization significantly for users of Constant Key Data disk drive Fixed Block Architecture disk support currently uses similar blocking.

The new librarian permits storing of different types of library records in the same file, as well as serving as a repository for memory dumps and record types defined by the user. A sublibrary identifier can be used to group related library members logically. Using these characteristics, even a large VSE site could theoretically have only one or two library files for the entire installation, as opposed to 10 to 30 currently.

The new library system is incompatible with the current libraries, and no support for the other format exists in either the current system or the new VSE/SP 2.1.0. This means that the ability to share old and new libraries and perform a system generation functions for releases while retaining under the other will not be possible for VSE/SP, as it has been for most past releases of DOS/VSE and DOS/VSE.

Change in ICDF

The ICDF program editor has been changed so that it can be disconnected from CICS operation. Currently, if ICDF is running in a CICS partition that terminates abnormally, then an ICDF recovery step often must be run before the CICS/ICDF partition can be restarted. For large ICDF files, this recovery step can take hours.

The ability to disconnect ICDF will permit other CICS functions to continue while the recovery step is being run, but on-line ICDF use will still be disabled until the recovery is complete. ICDF library backup will also be possible without taking CICS down as a result of the disconnection capability.

ICDF is no longer available without CICS; the TTF version is not supported under VSE/SP 2.1.0. Since ICDF is used in the standard install package for the new system, this also requires CICS, which increases a good part of the total VSE/SP software cost. Most VSE users already

Network Management Post-Divestiture

Survive Through Strategic Planning

Learn to Live in the Multi-Carrier/Vendor Environment

TELECOMMUNICATIONS
**DECISION
POINT 84**

Washington, D.C.
May 21 & 22
Sheraton Washington Hotel

Why You Should Attend:

DecisionPoint '84 examines specific network management issues facing telecom professionals and concerned users as they begin data and voice operations in the mixed carrier/vendor environment post-divestiture.

Key Topics Include:

- Assessing User Needs & Service Levels
- Networking Characteristics
- Carrier Services Today and 1990
- Major Vendor Directions
- System/Network Management
- Traffic/Performance Optimization
- Vendor Monitoring and Tech Control



Dr. Chen A. Lin

Full two-day program, session notes, lunches and reception with Dr. Lin, \$595. Attendees are invited to attend the NETWORK MANAGEMENT/TECHNICAL CONTROL Exposition May 23 & 24, and see the latest hardware and software products and services for network design, management and operations!

Register now or call for more information:

1-800-225-4698

(In Mass., 617-879-0700)

CW Conference Management Group
Box 880, Framingham, MA 01701

DecisionPoint '84 is presented by:



The DMW Group, Inc.



COMMUNICATION
NETWORKS

NETWORK
MANAGEMENT
TECHNICAL
CONTROL

Conference & Exposition

IN DEPTH/ENHANCEMENTS TO DOS/VSE

are committed to CICS, but it is essential to be a matter of choice.

The pricing and packaging of VSE/SP may be a matter of concern to users. The total bundled package concept is promoted both by the simplified one-price concept and by the fact that the various components interact not only during the system generation process but for many production functions.

The single-price implementation began with the SBC version of VSE, but it became practical for most VSE users only recently with the availability of VSE/SP 1.1 in February 1984.

VSE/SP 1.1 is available in two forms, one that permits most user customizing that was available previously and one that permits very little customizing by the user. An essential difference is how much source code is provided. Both are available for rental or one-time charges. The one-time cost for the version that can be customized is \$46,000; the other version is priced at \$40,000.

Hikes in software prices

IBM has raised the software prices affecting VSE users at rates far exceeding general inflation. For example, CICS/DOE has increased from \$350/mo in 1981 to \$450 currently. MCF has gone from \$85/mo in 1981 to \$200/mo with the VSE/SP 2.1.0 release. The one-time charge options might offer some relief from this escalation, but the "one-time" terminology is apparently misleading. For VSE/SP 2.1.0, the one-time charge is \$48,500, but users of Release 1.1 that paid the lower one-time prices have to make up the difference to get 2.1.0.

There is only one form of VSE/SP 2.1.0 that is apparently closer to the minimum customized form of Release 1.1. A Generation Feature may be ordered, apparently at no extra cost, but its description suggests that it includes only the source code necessary for using standard user interface and documented customization procedures.

In other words, for the first time, VSE system source code cannot be ordered. This possibility has been a concern for a long time to system software firms and the many users who modify or tailor the system extensively. It appears to have occurred rather subtly in the packaging of VSE/SP 2.1.0.

Spooling enhancements

Improvements were made to Power/VSE so that jobs may be submitted or reviewed concurrently by multiple tasks using the IBM-supplied interfaces. When running under VSM, Power will pass forms identification and other spool control information to the VM spooler so that the latter can sustain the job characteristics.

Improvements have been made to the POFLOAD command to make saving spool queue entries on tape much simpler.

Currently, jobs in the queue usually have to be modified before being saved, and these alterations must be retraced when the jobs are restored to the queue. The jobs are not automatically deleted from the queue when placed on tape.

Performance of the system may be enhanced by allowing a larger block size on the spool file. The shared-spooling option used by multiple-

GPU or VM users has been incorporated into the basic system. This appears to have been accomplished by raising the base price so that non-shared users have to pay for the option anyway.

Personal Computer support

Dubbed "Intelligent Workstation Support," this feature appears to be an integration of one or two existing low-cost software products into the VSE/SP system to permit data files to be transferred between an IBM 3270-PC terminal or an IBM Personal Computer with the 3278 Emulation Adapter and the VSE/SP system. The software is free; the Personal Computers are not.

VSE JCL has been extended to provide another MVS capability, conditional execution of job steps based

on the results of previously executed steps. Also, procedure JCL may utilize symbolic parameter substitution, which is also an MVS characteristic.

The new system is said to use a high degree of interactive dialogues, menus and Help facilities to aid both the systems installer and the users in system operation. Menus can be personalized so that users have easy access to only the functions for which they are authorized. This feature also apparently includes retrieval of system message explanations, effectively a set of on-line message manuals, which will be a significant aid to both operators and programming personnel.

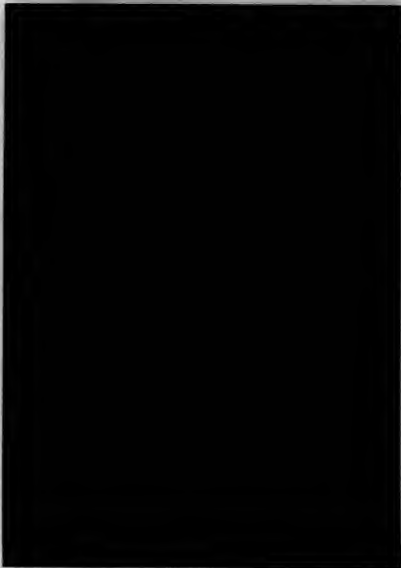
The VSE/SP 2.1.0 system is a significant announcement, with considerable capability added, but delivery, usage limitations and packaging

concerns cloud its value. Some large VSE users currently converting or planning to convert to MVS may be dissuaded from conversion by the announcement, but most of them will probably consider it too little too late.

However, the new system should provide a good base for continued support and future enhancement of DOB/VSE by IBM for use by its intermediate-level mainframe customers.

About the author

Moyle is president of B.I. Moyle Associates, Inc., a Minneapolis-based company specializing in DOB/VSE systems programming consulting and program products. He is also on the board of directors of the Independent Computer Consultants Association.



UNIX

UNIX.™ An ideal has been realized.

Some say UNIX is the operating system of the future. We say, why wait till then? Because you can get it right now on a full range of HP computer systems.

Yes. It's running on our MC68000-based machines and our powerful 32-bit systems, so you can pick the right computer for the job.

And since our HP-UX operating system is an enhanced version of the industry-standard UNIX operating system, you can take advantage of the growing

array of applications software available. You can also use the extra features of HP-UX, such as graphics and networking.

The UNIX operating system is only one of the high-powered operating systems we offer. And we put our full service organization behind all of them. We're ready to answer questions and to work with both end users and OEMs to find the best solution for any particular application.

UNIX

There's never been a better time. Let HP help bring your computing ideal to reality. Sound interesting? Call your local HP sales office right now about the UNIX operating system. Or write to Hewlett-Packard, Attn. Pat Welch, Dept. 003194, 19447 Pruneridge Ave., Cupertino, CA 95014. In Europe, contact Henk van Lammeren, Hewlett-Packard, Nederlands B.V., Dept. 003194, P.O. Box 529, 1180 AM Amstelveen, The Netherlands.

Productivity. Not promises.



**HEWLETT
PACKARD**

VIEWPOINT

Seymour Cray: May the force be with you



LLOYD
K. LECHT
Charles P. Lecht

It is really impossible to speak of supercomputers without speaking of Seymour Cray, founder of Cray Research Corp. Agnostic leader and hero, an Ota-Wan Enosho of the American scientific supercomputer community, he deserves our praise and admiration. Not that there are not others in the federation of big system scientists without whose contributions there would be no big systems to federate over, for example, William Norris of Control Data Corp. Although now he appears as a kind of Darth Vader to our Japanese friends (but more like a Wizard of Ota to me), he had the wisdom to bankroll Cray's venture about 15 years ago.

But Cray's contribution cannot be overstated. His company produces America's (and the world's) most widely used and sought after supercomputer systems. Its staff, including Dr. Steven Chen, mastermind of Cray Research's supercomputer project, the X-MP, is as talented a group of computerists to be found anywhere. As you can imagine, it must have been a humdinger of a battle for Cray Research to reach its position of preeminence, especially with IBM and AT&T around, the former ruling our country's mainframe business, the latter its communications facilities. Each supercomputer, as if possessing a force field not unlike Starb's gravity, brings to bear upon the event of its occurrence the coordinated results of many processor and communications companies. In the realty big systems, ever larger seas of terminals are presumed, the locations of which are widely distributed and increasingly ad hoc, if not downright nonexistent.

In such systems, close cooperation is required of IBM and AT&T — their products are inevitably and heavily involved. Connecting this environment to a supercomputer/mainframe, which, to complicate matters, has the capacity to assume multiple "personalities" to its users is clearly no simple

task. As you can imagine, except in protracted security situations, Cray Research's systems installations could never go unnoticed — certainly not by IBM nor AT&T nor anyone else with an eye to super profits through supercomputer development. Getting this group to believe itself and convince so Cray could create his systems and offer them to a public entranced in other's products suggests that Cray may be more useful to us as arm's control negotiator than making computers.

Americans (and many others) carry over a debt of gratitude to Cray and his research group. Their steadfast belief in the benefits of bigger systems, and their fervent resolve to create them without government subsidy, represents a commitment unique in the highly politicized world of supercomputer development. Even though our government had a lot to do with Cray Research's early survival, today's world scientific community cannot help but notice that there is no shortage of customers for Cray Research systems. The Japanese giant, Hitachi Telegraph and Telephone Co., a government-owned and -operated company, recently ordered one despite the alternatives available at home in Japan, alternatives that cause us concern over slipping U.S. leadership. Selling for a cool \$8 million to \$10 million each, Cray Research's personal systems, very high-speed vector processors, are backlogged a year in delivery orders and are deemed so indispensable to America's health and welfare that they cannot be sold without the U.S. Department of Defense's approval.

The fact that so many supercomputer companies have emerged in recent days and that our older capable establishments are not finding a shortfall in work gives eloquent testimony to our burgeoning thirst for more and more supercomputing power.

America has everything to gain by continued investment in supercomputer technology, and private and public monies will be needed for this effort. While agreeing with Cray that governmental financial support should be the last resort, I believe that our country's future is clearly dependent upon our resolve to press forward in this movement, even if some government support is needed. Failure to fund the needs of the fastest possible supercomputer effort will weaken, at worst, America's capacity to provide national security for its citizens; at best, our economic competitiveness.

We cannot tolerate those or the myriad of other deleterious events that will surely result from anything but a full-throated effort to invent and create evermore powerful computer systems. In the forthcoming industrial revolution, they will parallel the importance of oil refineries to the last. Massive repositories of power must convert otherwise inert data into live information to manifest the dynamic energy released by its timely usage. It is conceivable that forthcoming generations will compute their worth by the power vested in their supercomputer systems in much the same way that today's does with its oil reserves.

Information: the ultimate product

As electricity provided us with evermore localized power sources from which we may withdraw the "juice" needed to energize just about anything mechanical, the supercomputer system, alone and/or embedded in an Integrated Services Digital Network, will do no less for anything informational. As electricity is the ultimate product in a continuous process of refinement of sludge, so is information the ultimate product in the processing of raw data. Our perception of the world as given by this data, unprocessed or processed poorly, causes us to burn "crude" to energize our thoughts. This may explain why the event of our thinking is notoriously inefficient and low of yield. Supercomputer systems provide us with sophisticated data refineries — creators, organizers, classifiers, recorders, recallers, distributors and interpreters of information on a scale needed to fuel the process of such and every one of us so as to inform our thoughts and actions better.

A society devoid of these supercomputers, however clever its citizenry may be, cannot ever hope to unlock the mysteries of energy, health, production and peace that have eluded us for so long.

The forthcoming "International Workshop on High Level Computer Architecture — '84," sponsored by the University of Maryland at the Hyatt International Hotel in Los Angeles on May 21-25, will offer a fantastic program. It will be half tutorial, half workshop, led by some of the world's leading big systems experts: John Backus and John Cocke, Leonard Haynes, D.K. Hols, Edward Liebowitz and others of interstellar stature will bring the supercomputer superstars together yet one more

See COW page 98

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

User training by DPers strengthens needed ties



JACK
STONE
Jack Stone

Most DPers shy away from the subject of seriously training users in areas that must be learned in order to deal effectively with computer systems.

Of course, the specific excuses for avoiding the subject are roughly consistent with the technological focus of the day, even all the way back to the time when IBM's 360 and JCL were dominant themes.

Then the technology was deemed by many DPers to be too difficult for users to understand, so users not only were rarely brought up to date processing speed, but they remained in the dark about computer system operations for years. On sure, the center staff would toss a few educational crumbs to the user masses, like funding some outside seminars or installing a library of videotapes, but it typically would dump the responsibility for training on the users themselves, which everybody knows is not terribly efficient.

Nowadays, most centers are avoiding this responsibility by claiming that personal computers are wonderful learning vehicles and are so easy to

learn that users can handle the challenge themselves.

Surely, you have heard DPers answer inquiries for personal computer instruction — or, perhaps, you have made them yourself — with such unimpressive results as "The vendor manuals are much improved, and they are perfect for you."

"But if you find they're not sufficient, buy some texts or tutorial diskettes. Now, if you'll excuse me, I must return to my mainframe problems."

The point is this: DPers should seize the opportunity to supervise ongoing user training — or at least coordinate it — for the following reasons:

• The computer center is the best judge of the knowledge and skills that users need.

• A central control would help assure that limited funds are used more efficiently.

• The use of current DP staff as occasional instructors would help build communications skills as needed.

• The effort would build an enormous reservoir of good will, an area in which the centers should seek all the help they can get.

Program may result in responsible DPers

Juliana Hall, who heads DP operations at the San Francisco Museum of Modern Art, wrote the following letter on how her user-education program may well result in responsible DPers.

"After reading your article 'Another approach to building DP-user relationship' (COW, Feb. 27), I quickly took steps to inform our staff further of the basics of data processing.

"Our organization is one of the few . . . art establishments that have in-house mini systems (A Digital Equipment Corp.) PDP-11/14, RS/RS operating system with Arts System Application software.

"As the manager of our computer operations, I've found that arts organizations such as ours have unique staff environments. Many users, being artists or artistically inclined themselves, have either an extreme interest or no interest at all in computer operations.

"The desire to know is my major cue for pinpointing employees who will develop into responsible DPers.

"I personally look forward to the day when [he quote from the article] 'the up-and-coming user . . . with an experience base of personal computers and an elementary appreciation of the complexity of system problems' will make up the DP operations staff.

"This will no doubt enhance the efficiency of a mechanized organization along with the potential to develop higher and more sophisticated standards in operating and/or managing arts organizations."

VIEWPOINT

How to speak effectively at technical presentations



**READER'S
PLATFORM**
Ragh M. Khanna

Imagine yourself speaking before an audience comprising people who know nothing about your subject. You are thrilled about it. But as you look at the audience, you discover most of the people are not listening either because they find the topic boring or because they just do not understand you.

Sound familiar? Too often, people employed in technical occupations become entangled in jargon and esoteric concepts. When they talk before an audience, they are often bewildered by the seemingly inattentiveness of those before them. The fact is, however, nothing is wrong with the audience. The problem lies with the speaker.

As a speaker, you are responsible for maintaining the interest of the audience. You must present the material in such a way that the audience leaves informed and enthused about your subject. To accomplish that task, follow eight simple steps:

■ **Define exactly what you are going to say and to what degree.** For instance, is the topic detailed or general? Simple or complex? By defining your subject, you can partially determine the kind and amount of material that will be incorporated in your presentation. Under no circumstances should you call a body of people together to discuss something that is ill defined, particularly in your mind. After all, how can you expect the members of the audience to know what the subject is if the speaker does not know himself.

■ **Define your audience.** You should consider factors such as the audience's ability to understand the material, its prior knowledge of the subject and, possibly, its socioeconomic status. A key point to remember is that an audience usually comprises individuals who have diverse interests, needs and backgrounds.

After conducting such an analysis, you can then develop a speech that is at an appropriate level for your audience. For example, if you are speaking before a group of professional colleagues, you can speak on a higher level about your subject. But if you are talking to an audience comprising people who know little or nothing about the topic, you will have to discipline yourself to speak on a lower level. The burden is on you to speak in terms that are understandable to the audience.

■ **Inspect the place in which you will present the speech.** Pay particular attention to the room size, seating arrangements and facilities. A large room may require the use of a public address system. An irregular seating arrangement could hinder the audience's viewing of visual aids. A lack of facilities, such as a podium or overhead projector, could make speaking difficult for you.

■ **Prepare yourself for the presentation.** You should prepare an outline or speech that contains an in-

troduction, body and conclusion. In the introduction, you should summarize the main points or state your thesis (the central idea). In the body, you should arrange the contents in a logical order, such as topically, chronologically or spatially. In the conclusion, you should either summarize your main points or focus on your objectives.

Your introduction and conclusion should be as dynamic as possible. The introduction must be a real attention-getter to obtain the audience's interest. The conclusion should be forceful so that the audience will remember what you said. In either case, you must strive for im-

pect. The body should contain facts, figures, testimonials and logic to buttress your main ideas. To further interest in your ideas or remarks, you can incorporate wit, humor and personal experiences.

Practice your presentation so that your delivery does not detract from ideas presented in your speech. You should pay particular attention to the use of visual aids. A common problem is turning one's back to the audience and reading the visual aids. Also, ensure that you do not read your speech. The best delivery is one that sounds natural and unhesitated.

■ **Always maintain eye contact**

with your audience throughout the entire speech. If you spend your entire time reading the speech or looking at some distant object, you are, in essence, ignoring the presence of the audience. Its members, in turn, will ignore you and you will, therefore, have failed to communicate your message. Maintaining good eye contact suggests to the audience that you are interested in your listeners and generates enthusiasm.

■ **Define your terms.** Even among experts, this is necessary if you seek to be on the same wavelength as your audience. This is mandatory for technocratic speakers who talk before an

See SPEAKER page 90

How many of the world's 15 largest airlines are



All of them:

Motorola is a world leader in advanced electronics for memory, logic and voice and data communications.

* As defined according to the International Telecommunications Association

VIEWPOINT

IRS ruling casts doubt on computer tax shelters

**IRAMER'S
PLATFORM**
Stephen J. Melitzbaum

The Internal Revenue Service has recently issued a letter ruling that casts significant doubt upon the continued viability of computer tax shelters. The tax shelters have been widely used as a means of attracting capital by software development firms and entrepreneurs. The result may be a reduced availability of funds for new software development and basic research on new hardware. The position taken by the IRS

would require that investors in the shelters, which are forms of research and development limited partnerships, be taxed at ordinary income rates on a substantial portion of the revenues realized upon the successful completion of software development.

Previously, investors in a properly structured venture have been taxed only at capital gains rates. Because ordinary income tax rates can reach as high as 70%, while capital gains rates are limited to a maximum of 28%, the effect on investors may be significant. The computer R&D limited partnership has been an attractive means of financing the development

of new software products.

To a lesser extent, the computer R&D limited partnership has also been used to develop hardware devices. Many computer and high-technology firms have R&D partnership subsidiaries.

Traditional software tax

In the traditional software tax shelter, a limited partnership is formed by an existing computer company or by a start-up venture. Investors are then solicited to fund the development of a software or other high-technology project. Because development of new software generally qualifies as an R&D expense under

the tax code, the entire investment in the development effort is tax deductible. The IRS has not disturbed the deductibility of software development costs.

However, upon the successful completion of the software development project, the completed software or the research subsidiary itself is sold.

In a properly structured computer R&D tax shelter, the gains realized upon the sale of the software or of the venture have been taxed as capital gains. It is this taxation at capital gains rates that has made the computer tax shelter and R&D tax shelters, in general, highly attractive.

Ordinary income

In the new letter ruling, however, which has only recently become widely available, the IRS has taken the position that capital gains treatment is not available to investors until ordinary income equals the total of all deductions previously taken. Thus, the investors in the software development effort would be taxed at ordinary income rates until the gains realized from development of the

The computer R&D limited partnership has been an attractive means of financing the development of new software products.

software exceed the amounts previously deducted for development of the software.

In taking this position, the IRS cited a principle known as the tax benefit rule. This rule states that where a taxpayer has been allowed a tax benefit, such as a deduction, any amount subsequently recovered must be treated as ordinary income until the deductions are offset. The tax benefit rule has not previously been applied to this type of tax shelter. In fact, the R&D limited partnership tax shelter has its roots in a specific section of the tax code that has been assumed to supersede the tax benefit rule.

The effect of this letter ruling by the IRS on existing development projects, as well as on the formation of new computer R&D limited partnerships, remains to be seen. A letter ruling is technically nonbinding on the IRS or the public and does not rise to the level of a formal revenue ruling or tax regulation. Letter rulings do, however, provide an indication of the current views of the IRS. Future auditing activities and regulatory pronouncements by the IRS will indicate whether this letter ruling is merely an anomaly or whether it marks a fundamental change in the tax treatment of computer R&D tax shelters.

However, until the effects of this new letter ruling become clear, the flow of funds to computer and other high-technology projects may be slowed.

Melitzbaum is an attorney with the New York firm of Brown, Bagman & Melitzbaum.

served by our data communications systems?



MOTOROLA/codex

Users, DPer: they're more similar than you think



**READER'S
PLATFORM**
Norm Katan

Is there any business setting in which the user-DP relationship is not an adversarial one? The mind-sets of the two areas seem to differ in predictable ways. DPer frequently claim that users don't know what they want, are too demanding and don't appreciate the complexities of application development. Users, in turn, tend to feel that DP doesn't understand their business needs, and when it delivers, if it delivers at all, it is frequently too little, too late.

I've often wondered whether users and DPer are inherently different types of people or whether, as I suspect, the difference results from the culture in which each area operates. Is it possible that DPer become so immersed in the coloration of the technojungle that they become unable to see problems from the business perspective? That users, who are generally nontechnical, but intensely dependent on DP, have been put in a position in which they must make demands of DP? Is it possible that any of us — DP or user — if placed in the shoes of the other, would begin to think and react like the other?

The response that comes to mind first is "no way."

Stabbing shades

But the new era of end-user computing, fourth-generation languages and application development tools is challenging this response. The bold line between users and DP is starting to become a little fuzzy, and both are beginning to think in ways that are strikingly similar.

The most obvious way in which users are beginning to sound like programmers is in their use of fourth-generation languages. The computer, the terminal and the programming language are no longer exclusively in DP's domain.

Users, for better or worse, are learning to write programs, and many information center managers have observed the ease with which users have taken to the world of computers.

Of course, software vendors are entitled to credit for products that nontechnical people can learn easily. But it goes beyond that. Many users are picking up the rudiments of job control language beyond DP's expectations. Users given responsibility for efficient use of assigned disk space and tapes are doing a commendable job. Increasingly, users are being heard discussing program libraries, file concatenation and sorts, merges and joins as if they've been doing it all their lives.

The potential benefit to DP is significant: These users naturally have more credibility within their own departments than DP does. As users become conversant in technical matters, they are helping to educate their own management and peers. To pers-

phrase one user: "[Management] is driving me crazy; it wants results immediately. I have to extract the data, sort it, summarize it, merge it with another file, generate several reports and then analyze the results. I'm trying to get [management] to understand this takes time." This user, some months earlier, had complained vehemently about DP and what she saw as delays in responding to her DP requirements. As users ascend the learning curve of technical proficiency, a sense of shared understanding appears to exist.

In addition, users are increasingly able to present their problems and questions to DP (and particularly to

the information center) in accurate, technical terms. DP, unfortunately, has always had a hard time speaking the language of the user. Instead, as we are seeing, users are learning to speak the language of DP.

Potential problems

Two potential problems to this situation — one for DP and one for the user department — are emerging.

■ The age of DP as the guru of all things technical is rapidly disappearing. To say this is a threat to many DPer is putting it mildly. Although technophobia is real and widespread, it is less prevalent among business users than one might presume from

the explosion of computer literacy courses. Users, in fact, are beginning to be able to offer technical pointers to DP. How well the DP ego will be able to tolerate this situation remains to be seen.

■ For the user department, fourth-generation-language-trained staff will be in short supply over the next couple of years; trained personnel will be highly marketable and, therefore, mobile. Trained users are also becoming attractive to DP shops and information centers. Many information center managers find the best applicants to be those with a mastery of information center products and services and an understanding of the

DON'T LET THE STEPS KILL YOU.

Take The Ramp. ROLM has perfected a breakthrough communications controller: The CBX II.

It's the centerpiece for a spectacular new ROLM® business telephone system — the fastest, most advanced way to manage voice and data in the world.

Instead of the typical stop-start steps of expansion, CBX II lets you grow smoothly,

easily and very, very cost-effectively.

You can move up The Ramp from sixteen phones to more than ten thousand phones, terminals and personal computers. You can store and forward messages. You can monitor costs. You can have the least expensive long distance routes automatically, instantly. You can even network networks, from Dow Jones to the IBM Infolnet. And we're plugged into

Katan is information center manager and microcomputer coordinator at Blue Cross Blue Shield of Massachusetts in Boston.

VIEWPOINT

business from the user perspective. For the information center, the hiring of its users is a plus; the affected user department may feel otherwise.

As for DPer's beginning to think like users, the signs are appearing in some interesting ways. DP management is beginning to appreciate the value of fourth-generation languages to support its own decision-making needs.

But listen to a few requests from DP managers; after a while it is necessary to face the shocking fact that DPer's are not necessarily any better at specifying their requirements than users are.

In one typical case, a DP manager asked to have a report generated. He drew some circles and boxes on a blackboard, drew some lines connecting them and asked to have the out-

put as soon as possible. Analysis of the technically doable request indicated it would generate meaningless results. After asking him a few more questions, the DP staff determined that what he asked for and what he really wanted were two different things.

DP use of personal computers is another area in which DPer's occasionally sound like non-DP-trained users.

Many DPer's are no more careful about backing up their data diskettes than are users new to the concepts of backup and recovery. DPer's are not any likelier to organize their data across diskettes in a logical manner or even to keep their diskettes in a secure location when not in use.

The cost and benefit of managing the use of diskette space is only grad-

ually sinking in.

DPer's are not necessarily any less vulnerable to user-friendly hype—even after years of horror stories revolving around application software packages. Often, DPer's, like users, need to be advised that many such products are not quite as simple to use as the ads imply.

Users and DPer's are not really so different. As users learn DP skills and DPer's become end users of personal computers and fourth-generation languages, it will become increasingly difficult to tell the two apart. Whether this is seen to be a positive or negative outgrowth of today's technology may depend on whether you are a DPer or a user. There is no question that the implications for both the user and the DP culture are far-reaching.

SPEAKER from page 86

audience of nonexperts. The easiest way to lose your audience is to use terms that no one understands. In addition, when referring to numbers, you should round them off and, whenever possible, use them in a form that is easily understandable—that is, put them in forms such as percentages, ratios and multiples.

Use visual aids whenever possible. These include slides, easels, foils, blackboards and the like. With a diagram, drawing, photograph or model, a complex idea can be shown clearly and concisely.

Provide the audience with the opportunity to ask questions either during or after the presentation. Even though most speakers dislike questions, no reason exists to fear them. If you cannot answer a question, jot it down along with the individual's name so that you can later give him the answer. Above all else, be concise in your responses, and do not argue with a member of the audience. Not only is it in poor taste, it will only feed upon your nervousness.

CRAY from page 85

time.

I encourage everyone who can to attend; it promises to be better than the Disneyland or Epcot experiences for those who love science and wish to enter the fascinating world of supercomputers. Topics will include such intriguing subjects as "Whither Hundreds of Processors in a Data Base Machine?" "Prolog Machines," "Reduced Instruction Set Architecture Machines" and "Parallel Inference Machines Based on the Data Flow Model." This formidable esoteric-sounding stuff can be understood at various levels. With such brilliant speakers present, even journalists manage to become mesmerized (and you know what that implies).

Personally, I found myself intrigued with the University of Maryland announcement for the meeting. It is five pages of finely printed material that never once mentions the word "Cray." I presume this to be the result of an unfortunate oversight; it's hard to see how many of the topics could avoid addressing the leading supercomputer system, upon which so many of the experiences under consideration have been exclusively implemented.

Persevere, O gallant knight of supercomputer superstardom! You have captured our collective intellect and our imagination; your pioneering efforts promise to set our powers free. You stand at the front of The Federation's galactic fleet, leading the development of this vital national resource. Your task may not be as easy one, but it shall be rewarding. Seymour Cray, may the force be with you!

This is the third in a three-part series.



IBM and HP and DEC and Data General and the other movers and shakers to guarantee that we can take their new products and new systems in stride.

The CBX II is just the latest reason why ROLM is the choice of more than two-thirds of the Fortune 500 companies, why more than fourteen thousand ROLM systems are up and running today.

When it's all said and done, the best thing about The Ramp is that it ends that recurring nightmare that you may be buying a business communications system that can't grow, can't change or has a big, gee whiz capability missing.

You can make your life a lot simpler. Just skip the steps and take The Ramp.

ROLM



More byte f



Now you can get more hardware without getting more hardware. Simply link your technology with ours in a profitable partnership. Like 66% of the Fortune 500 already do.

For the buck.

We solve the problems of the new breed of MIS manager who demands cost-effective solutions.

Who insists on utter reliability.

And who desires state-of-the-art capability in a world which moves too fast for any one organization to keep up with all the latest advances.

Take our international computer network. It's the biggest commercially available network (bigger than any other network system from anyone else). It delivers information between 750 world cities in 25 countries across 23 time zones, driven by 3 superpowerful hardware centers in the US and Europe, with a system availability record higher than 99%, and with security standards second to none.

You can use it to make your information as multinational as your company.

Or to pull all your hardware, software, systems and people together in one compatible system.

Or to provide on-line processing solutions all over the world.

Whatever.

You can also hire more analysts without hiring more analysts.

Use our 4,500 experts around the world to consult, design, program, engineer, install, maintain, train and even operate an entire international system for you—with key applications up-and-running in as little as two months (instead of the two years you might typically expect from others).

For more information, dial this number: 800-638-9636.

Or contact us by electronic mail.*

And get more byte for the buck.

**You can use any ASCII terminal. In the U.S. call 800-638-8369 Listen for the computer tone and insert the telephone into the coupler. Press the "H" key several times, then the carriage return key. The system will then request that you enter a user number. Enter REK10111, GEISCO. The system will then prompt you for further information. If you want, you can even start using our QUIK-COMM electronic mail system right away.*



**INFORMATION
SERVICES**

General Electric Information Services Company, U.S.A.

What we is a failure to c



have here communicate.

Word processors can't always communicate with other word processors.

Internal mail networks can't often communicate with other outside networks.

Apples can't communicate with oranges.

People can't always communicate with people.

The advanced technology that was designed to enhance communication is sometimes leaving its users wondering if it might be better to go back to the Pony Express and carrier pigeons.

The answer? The QUIK-COMM™ System, a global electronic mailbox service.

QUIK-COMM is a worldwide communications integration system. So you can make your business information as multi-national as you are.

It's the largest, most advanced and comprehensive worldwide business communication system, with a continually expanding array of enhancements. And the system allows utilization of your existing equipment.

No other system can match what we offer in network, application capability and worldwide coverage. And no other system has the name General Electric on it. Which says a good deal about things like quality, reliability, service support and commitment.

We'll work together to define your needs, and develop the best solution for you. Give us a call. (800-638-9636) or contact us by electronic mail*.

GE Information Services Company
Manager of Client Services, 401 North Washington Street
Rockville, Maryland 20850

Name _____ Title _____
Company _____
Street _____
City _____ State _____ Zip _____
Tel. no. _____ Telex _____



**INFORMATION
SERVICES**

General Electric Information Services Company, U.S.A.

*We use our own AIXM terminal. In the U.S. and 800-638-9636. Listen for the computer tone and insert the telephone into the computer. Press the "0" key several times, then the carriage return key. The system will then request that you enter a card number. Enter 00000, 00, 0, 0, 0, 0. The system will then prompt you.

We fly more places



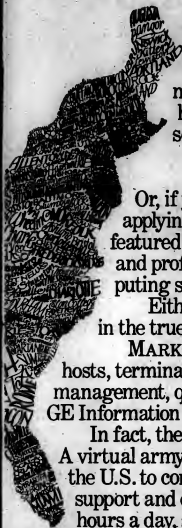
Hang on to your seats.

Because now there's a new way to move information. The MARK-NET™ value-added network from GE Information Services.

It links over 600 cities in the U.S. Meaning you can move information less expensively, more reliably, and yes, to more places than you ever could before.

Yet that really isn't so surprising when you stop to realize MARK-NET Service is based on the largest commercially-available

es than anybody.



teleprocessing network in the world. The one that connects over 750 cities around the world. And that, after 14 years of serving major corporations, has achieved the most highly acclaimed reliability, data integrity and security in the industry.

But now for the latest news.

You can opt for MARK-NET fly-only service.

Or, if you need help preprocessing, postprocessing or applying your information, take advantage of our full-featured, fly-and-process service. With all the software and professional resources of the largest network computing service in the world at your disposal.

Either way, you'll be getting a value-added network in the truest sense of the word.

MARK-NET includes all the connections for popular hosts, terminals and protocols. And the complete network management, quality, security and service you associate with GE Information Services.

In fact, there's actually a network to support the network. A virtual army of 3,500 professionals distributed throughout the U.S. to consult and help you with installation, training, support and even Bell connection problems. On call 24 hours a day, seven days a week, 365 days a year.

Of course, you might have expected that from someone with initials like ours.

But that makes it that much easier to remember who to call the next time your information needs to fly.

Call us at (800) 638-9636, ext. 3001. Or contact us by electronic mail.*

GE Information Services Company
Manager of Client Services, 401 North Washington Street
Rockville, Maryland 20850

Name Title
Company
Street
City State Zip
Tel. no. Telex



**INFORMATION
SERVICES**

General Electric Information Services Company, U.S.A.

*You can use any ASCII terminal, in the U.S. and 800-638-9636. Lines for the computer are not shared with the telephone into the computer. From the "12" key second block, use the carriage return key. The system will then request that you enter a user number: Enter 999, 9999, 99999. The system will then prompt you.

"How I increased user satisfaction with the flick of a switch."

"MY DP DEPARTMENT WAS UP TO HERE IN WORK."
"AND ROUTINE END-USER REQUESTS WERE JUST ADDING TO MY BACKLOG—UNTIL I HEARD ABOUT THE SOLUTION CENTER."
"IT'S A COLLECTION OF USER-FRIENDLY PRODUCTS THAT ALLOWS ALMOST ANYONE TO DO THEIR OWN DATA PROCESSING."
"THAT WOULD MAKE THEM VERY HAPPY."



"AND ME A LOT HAPPIER TOO."
"SO I TALKED TO HONEYWELL, SET UP A SOLUTION CENTER, AND..."
"BILL, I NEED AN ANALYSIS OF WESTERN DIVISION SALES DESPERATELY."
"CLICK."



Introducing The Honeywell Solution Center

Now there's a way you can increase the satisfaction of your end users and improve the responsiveness of your information management system. It's called a Solution Center.

A Solution Center is a user-support facility that enables personnel throughout your organization to do their own data processing, quickly and easily. And it enables you to give them direct but controlled access to online information.

Increases Productivity

A Solution Center features Honeywell's GCOS8 software that ranges from personal productivity and decision support tools to business-specific solutions. So now your end users can build their own spreadsheets, forecast trends with color graphics, browse through online files, and create or revise reports.

Think of how that could increase their productivity as well as their satisfaction. And, by freeing the MIS staff to do more of the significant tasks they were hired to perform, a Solution Center can increase the productivity of your data processing department, too.

Improves Data Management

A Solution Center improves data management by providing consistent information to end users and by eliminating unnecessary application development. It can facilitate the introduction of personal computers. And, best of all, you can tailor it to meet your specific needs.

With a Solution Center, end users get the information they need and you get the control you demand. It's bound to make them a lot happier, and you a lot happier, too.

For more information on how a Solution Center can work for you, call toll free at 800-328-5111, extension 2724. In Minnesota, call collect 1-612-870-2142, extension 2724.

Another Big Idea From Honeywell Large Systems

Look to Honeywell Large Systems for solutions to information management problems and for products ranging from powerful computers to comprehensive networking capabilities.

Together, we can find the answers.

Honeywell

SOFTWARE & SERVICES

Fourth-generation language use must be planned, report says

By John Eastman
CW Staff

Fourth-generation languages will have a significant impact on data processing and end-user productivity. But if their use is not properly planned, those benefits may be "outweighed by increasing costs and inefficiencies."

That was the core of the findings outlined by Input, Inc., a Mountain View, Calif.-based research firm, in its recent report, *Opportunities of Fourth-Generation Languages*. The study was based on nearly 40 interviews with managers in companies that are using, or planning to implement, an information center plus interviews with fourth-generation language vendors.

Input said fourth-generation languages are on the brink of becoming a major means for accomplishing mainline information systems tasks—a move from their traditional role as an end-user-oriented tool. But because the information center remains the "primary delivery vehicle" for fourth-generation languages, information systems and information center strategies must be well coordinated.

In a disquieting note, Input cautioned that a lack of support staff could "undermine the effective use of fourth-generation languages." The report projected that the growth of fourth-generation-language support staff will lag considerably behind

the rapid increase in use predicted for programmers and nonprogrammers.

Still, Input outlined a rosy future for fourth-generation languages through 1985 among all user groups. Not surprisingly, end-user use will increase more rapidly, but the study indicated that the high rate of use foreseen by information systems programmers may "signify increasing acceptance of fourth-generation languages for 'professional' programming."

The report stated that the current generation of fourth-generation languages provides a trade-off in personnel time savings and increased machine requirements caused by a decrease in language efficiency. Thus, the estimated average 80% time savings realized through fourth-generation-language use is offset by increases in required CPU and memory. The study estimated these increases at 75% more than the Cobol equivalent.

Input predicted, however, that the increased resource demands will be "balanced by steady improvements in language efficiency and even faster improvements in hardware price and performance." Added to that, technical staff costs and backlog problems will provide an even stronger impetus to fourth-generation-language use in production environments. As a result, the report concluded that "fourth-generation

See FOURTH page 74

Fourth-generation languages: Cure for DP ills?

Fourth-generation languages can "directly support information systems efforts to extricate itself from a variety of problems," according to a recent study.

Among the problems are:

- Information systems' isolation from the organizational mainstream.
- The creation of unsatisfactory systems, such as applications that are late, incomplete or inflexible.
- A perception of the information systems department as unresponsive.
- User ignorance of data processing functions.

Input, Inc.'s *Opportunities of Fourth-Generation Languages* said fourth-generation languages are "inherently attractive" as production tools. But the report cautioned management to introduce them on a pilot basis first in order to gain experience and to document costs and benefits. The impact of a fourth-generation language on machine resources must also be carefully assessed, the study stated.

Although most respondents said they do not view fourth-generation language

See ELS page 74

INSIDE

Systems Software/89

Application

Package/89

DBMS/74

On-Line

Data Base/74

Nixdorf announces on-line data entry package

WALTHAM, Mass.—Nixdorf Computer Corp. and Nixdorf Computer Software Co. have announced the ODE on-line data entry software system for use with Nixdorf's 8890 Information System series and IBM 370, 4300 and 30 series mainframes.

According to a spokesman, the on-line data entry package is an advanced data entry system designed for mainframe users with high-volume, on-line applications. It is also said to provide users of Nixdorf's X80/600 series key-to-disk systems with a bridge to larger capacity systems.

The spokesman said on-line data entry

runs on the Nixdorf 8890 under Nixdorf/VSE and under its compatible Edos/VSE and Edos/VSE operating systems. It is also available under IBM's DOS/VS, DOS/VSE, VSE/SSX, OS/VS1 and OS/MVS operating systems.

The product is supported by either Nixdorf's Task Control Program or IBM's CICS, and it features application interfaces to Cobol, PL/I and assembler to support user-exit processing.

The package complements Nixdorf's Data Entry Generator package for basic data entry by extending the facilities and

functionality of the data entry environment on a mainframe to a level comparable to a dedicated key-to-disk system, according to the vendor.

The package reportedly features facilities for data entry, system control and application definition, and extensive operator and supervisor security levels are provided.

Prices for the on-line data entry package begin at \$18,500; the package is also available on a monthly lease basis.

Nixdorf Computer is located at 300 Third Ave., Waltham, Mass. 02154.

MVS/VS1 Users

Improve Response Time!



PMO

Reduces disk busy, channel busy and CPU utilization to dramatically improve response time and system turnaround!

Quick-Fetch

Gain virtual storage constraint relief and improve response time automatically!



Duquesne Systems, Inc.
2 Allegheny Ctr., Pittsburgh, PA 15212
Call our Marketing Department:
1-800-323-2600
Inside PA: 412-323-2600

SOFTWARE & SERVICES

SAS unveils DOS/VSE software

CARY, N.C. — SAS Institute, Inc. has announced that four software packages in its SAS System line are available for users of IBM's DOS/VSE operating system.

According to a spokesman, the recently released products for DOS/VSE include the SAS/Graph package for device-intelligent color graph-

ics; the SAS/PSP (Full Screen Product) package for data entry, editing and letter composition; the SAS/OR (Operations Research) package for operations research and project management; and the SAS/IMS-DL/I package for interfacing the SAS System to IBM DL/I data bases. The spokesman said that

with the base SAS statistical software package and the SAS/ETS (Econometrics and Time Series) library, these products give DOS/VSE users access to the full SAS System. SAS Institute licenses the base SAS product for a first-year fee of \$7,800.

SAS is at SAS Center, Box 8000, Cary, N.C. 27511.

SYSTEMS SOFTWARE

JOHNSON SYSTEMS, INC.
Roscoe Interface; Jara/CICS DMS Interface

Johnson Systems, Inc. has announced the Roscoe Interface and the Jara/CICS DMS Interface.

According to a spokesman, the Roscoe Interface provides users of Johnson Sys-

tem's Job Accounting Report System (Jars) for the IBM OS operating system with the ability to process accounting and utilization information from Applied Data Research, Inc.'s Roscoe remote job entry system. Roscoe users can be charged individually by terminal session and for other uses unique to Roscoe.

The Jara/CICS DMS (Data Management System) Interface is said to be an option to Johnson Systems' Jara/CICS package. The interface provides IBM CICS users with accounting and chargeback capabilities for IBM's DMS by maintaining information unique to each DMS pool. The interface is said to be a data collection tool that reports on DMS usage through a unique identifier.

Until June 30, permanent license fees are \$2,000 for the Roscoe Interface and \$1,000 for the Jara/CICS DMS Interface. After that date, the permanent license fees will increase to \$8,000 and \$1,500, respectively.

Johnson Systems, 2500 Greensboro Drive, McLean, Va. 22102.

APPLICATION PACKAGES

CENTURY DATA SERVICES, INC.
Commercial Finance packages

Century Data Services, Inc. has introduced two commercial finance packages.

NAMEWARE

NAME
Salem, CT
Voice/data telephones
(Formerly Digital Transactions)

COMBOS
Oakland, CA
Business/financial software
(Formerly Quasar Systems)

COMING
Houston, TX
Portable computers
(Formerly Gateway Technology)

COMWAYS
Oakland, CA
Business telephone systems
(Formerly Scott-Burman)

DATA
New York, NY
Computer loans
(Formerly Dataware of NY/NJ)

DATA
Costa Mesa, CA
Software for IBM PC
(Formerly Gateway Software)

DATA
San Francisco, CA
Computer supplies
(Formerly of Crown/Zellerbach)

DATA
Mountain View, CA
Personal medical records
(Formerly of Data-Hill)

DATA
Sunnyvale, CA
Home computers
(Formerly 88-8 Computers)

BY NAMEWARE

Contact us for free booklets on product and company name development.

NAMEWARE, INC.
Name Development & Training Laboratory
771 Marina Boulevard
San Francisco, CA 94123
415-563-0379

cing The tThinks.

AVATAR PA1000 gives you an extra RS232 port. That gives you access to other local or remote asynchronous host computers or local printers.

HELP! If you need it (and who doesn't) you have help screens to put you back on track. The PA1000 also has easy-to-use, English language commands.

With a few simple keystrokes, you can switch from your IBM to the extra RS232 port, giving you access to private data networks and public databases like Dow Jones.

And when you switch back, the AVATAR PA1000 is smart enough to remember your IBM screen.

In a distributed terminal network, remote dial-in from personal computers or asynchronous devices is increasingly

important. You can dial into your PA1000 at the nearest cluster controller, and reduce communications costs dramatically in the process.

Just by typing "1-2-3" (how much simpler can you get?), the PA1000 automatically determines the baud rate of the attached device and is ready to go.

In just five minutes (no kidding) you can install the AVATAR PA1000. And you don't need to be a computer operator.

The AVATAR PA1000 even gives you a file transfer option that lets you transfer information back and forth between your personal computer and an IBM mainframe.

What will AVATAR think of next? The latest news is our PA1500, a link that lets you

print the output from your IBM host on a low-cost ASCII printer. It supports high-speed dot-matrix, letter quality, and line printers. It's very simple to install. And it will save you a bundle.



To find out more about the AVATAR PA1000, our company, our distributors and dealers, or our plans, just call us. In Canada or Massachusetts: 617-435-6872. Everywhere else: 800-828-2004 Ext. 600.



The Link That Isn't Missing Anything

Anator Technologies, Inc.
99 South Street, Hingham, MA 01948

At Morgan Stanley,
software is like any other investment.
They judge it by the rate of return.



SOFTWARE & SERVICES

Continued from page 69

mercial finance software packages for asset-based lending institutions using IBM mainframe computers.

The Commercial Finance Package reportedly tracks all machines revolving credit-based loans secured by accounts receivable, inventory and other forms of secured financing. The Accounts Receivable Debtor Detail Package tracks detailed accounts receivable data regarding revolving receivable loans.

Both packages operate on IBM 370, 30 series and 4300 series computers under IBM's DOS/VSE, MVS and VSI operating systems.

The Commercial Finance Package ranges in price from \$150,000 to \$175,000, depending on the number of modules. The Accounts Receivable Debtor Detail Package costs \$50,000.

Cesary Data Services, 444 Fifth Ave., New York, N.Y. 10018.

CAE SYSTEMS, INC.

CAE 2000/VX

CAE Systems, Inc. has introduced a computer-aided engineering software package, the CAE 2000/VX, for use by design engineers working with Digital Equipment Corp. VAX-11 series computers under the DEC VMS or University of California at Berkeley Unix 4.3 operating systems.

The product reportedly offers a multiuser distributed data base hierarchically designed to allow projects to be partitioned into multiple segments. It is also said to offer hierarchical command menus, pop-up menus, multiple overlapping viewpoints and user-defined macros, among other features.

The CAE 2000/VX can reportedly be interfaced with a variety of DEC VAX-11 series computers. It also can be used with several existing computer-aided design tools and supports several Megatek Corp. terminals, including the Megatek 1646, 1650 and 7260.

The package is priced at \$45,000.

CAE Systems, 1333 Bordeaux Drive, Sunnyvale, Calif. 94089.

NATIONAL INFORMATION

SYSTEMS, INC.

Version 4 of VUE

National Information Systems, Inc. has announced Version 4 of VUE, a computerized project management system.

A spokeswoman said the enhanced version features on-line help messages, redesigned menus, a new command mode, expanded resource capabilities, a time scheduled network and the incorporation of all processing into a single module. The software is said to provide a system for entering and reporting information in order to plan, schedule and track project activities.

A user can specify up to 100 resources per project compared to 10 resources in earlier versions. The time scheduled network provides bar chart information and precedence relationships of activities.

Version 4 of VUE runs on Digital Equipment Corp. VAX-11, PDP-11 and Decsystem 10 and 20 computers; Hewlett-Packard Co. HP 3000 processors; all Honeywell, Inc. systems; and Perkin Elmer Corp.'s 2500 series processors. A perpetual license for the basic VUE system costs \$18,000.

National Information Systems, 30370 Town Center Lane, Cupertino, Calif. 95014.

ADAGE, INC.

Solid 2000

Adage, Inc. has introduced a Pictorial-aided solids modeling display package called Solid 2000 for its Adage 3000 Color Master Display System.

Solid 2000 was reportedly designed for use in interactive computer-aided design applications and features rapid display of two- and three-dimensional solids modeling data and interactive three-dimensional transformation of solid, shaded objects. Its display functions include curved lines, bi-cubic curved surfaces and object and polygon mesh data types. It also allows interface to modeling programs.

The product is priced at \$5,000 for object code and is supported on Digital

Equipment Corp. PDP-11 and VAX-11 series computers.

Adage, One Fortuna Drive, Billerica, Mass. 01821.

BATALINE SYSTEMS, INC.

Cris

Dataline Systems, Inc. has introduced a software system for retailers called Cris (Computerized Retail Information System), which reportedly provides complete open stock tracking, among other features.

Cris also reportedly offers stock-keeping unit capability, inventory management with multiple locations and point-of-sale support. It is said to include computerized price tag printing, sales analysis, profitability reports and availability information by vendor, style, location, season and

category.

The Cris package is available for \$7,500 for Prime Computer, Inc. 60 series computers.

Dataline Systems, 18541 Gothard St., Huntington Beach, Calif. 92647.

VALID LOGIC SYSTEMS, INC.

Realist

Valid Logic Systems, Inc. has announced a simulation accelerator for use with its Realist system computer-aided engineering workstations.

The Realist simulation accelerator is said to boost simulation speeds by up to a factor of 500, the vendor said, while maintaining the Realist system's user interface and interactive simulation capabilities. The system reportedly consists of two high-speed

Continued on page 72



SOFTWARE & SERVICES

Continued from page 71

bipolar simulation engine dedicated to the simulation process.

One engine is a scheduler/descheduler that looks ahead to determine if a gate must be evaluated on any particular pass through the logic. The second engine is a dedicated simulation processor that performs high-speed evaluation of device primitives that must be evaluated.

Simulation speed and efficiency are reportedly enhanced through the evaluation of higher level primitives, such as registers, counters, adders and multipliers. A basic configuration of the system costs \$29,500.

Valid Logic Systems, 1305 Charleston Road, Mountain View, Calif. 94048.

PROJECT TRACKING, INC.

Project Tracking System

Pioneer Software, Inc. has announced a Project Tracking System for the IBM System/36.

Project Tracking monitors project progress, allowing the user to reduce costs and increase productivity. Inquiry programs offer on-line review of current status information.

The product runs under IBM's CP/6 and requires 3.5M bytes of random-access memory. It has a license fee of \$2,500.

Pioneer Software, 4250 W. 150th St., Cleveland, Ohio 44135.

MEGATEK CORP.

Three-dimensional graphics on Whizzard

Megatek Corp. has announced that three-dimensional graphics capabilities are now offered as options on its Whizzard desktop engineering termi-

nals and mid-range 3865 graphics systems.

All Whizzards reportedly now support three-dimensional modeling, including the monochrome 1645 and the color 1650 desktop engineering terminals.

Prices for the option on the 1600 monochrome and 3865 colorinals and systems begin at \$2,000.

Megatek, 9605 Seranito Road, San Diego, Calif. 92121.

ARMSPLUS, INC.

Armsplus

Armsplus, Inc. has introduced a menu-driven records management package for the Wang Laboratories, Inc. 2200 computer. The package reportedly has built-in recovery routines and is said to allow tutorial screens to be accessed at any time from anywhere in the system.

The Arms Record Management System (Arms) reportedly also has report writer capabilities. Add-on modules for Arms include Timetools, a time-scheduling program; Statools, a descriptive statistics and bar graph program; and Dataools, a collection of utilities for data file and disk management. Arms costs \$995. A demonstration disk is available for \$9.95.

Armsplus, Suite 300, 5000 E. Ben White Blvd., Austin, Texas 78741.

CALCOMP

Calcomp

Calcomp has introduced the Heating, Ventilation and Air Conditioning Package (Hvac) designed for Calcomp's IDS 6000 graphics system.

Hvac designs and draws systems automatically based on volume flow rate systems type, space constraints

and other criteria, the vendor said. Hvac produces analytical data for system integrity, air pressure and other factors, according to the vendor. The system works in three modes: automatic, semiautomatic and interactive. Hvac costs \$10,000.

Calcomp, 2411 W. La Palms Ave., Anaheim, Calif. 92801.

COMPUTER SUPPORT

SERVICES, INC.

Rama

Computer Support Services, Inc. has announced a Radio Accounting Management System (Rama) designed by a broadcasting company and including the screens and reports most requested by broadcasting firms.

The Rama program, for mail-to-medium-size radio stations, runs on the Wang Laboratories, Inc. 2200. It schedules commercial spots automatically and prints a daily log. It is said to provide sales and advertising reports on sales calls and sales expiration. It has an accounts receivable system, a billing summary, aged trial balance and cash receipts reports.

Rama supports multiple-station broadcast companies and costs \$5,000 with source code and documentation.

Computer Support Services, P.O. Box 500, Levittown, Pa. 17377.

SYSTEMS DESIGN

CONSULTANTS

Purchasing System

Systems Design Consultants has announced a purchasing package for

the IBM System/34 and System/36 computers.

The Purchasing System reportedly supports multiple companies and provides for entry and maintenance of inventory items, vendors and price quotations.

According to the vendor, price quotations from an unlimited number of vendors can be stored and accessed for comparisons. On-line requisition input, purchase order generation and several reports are provided. Priced at \$1,000, it includes documentation and source code.

Systems Design Consultants, No. 117, 535 Fairview, Carson City, Nev. 89701.

ARCAD

Aids

Arcad has announced the Architectural Interactive Design System (Aids) computer graphics software for the Digital Equipment Corp. VAX-11 line of processors.

According to a spokesman, the software encompasses a range of applications for architects, engineers and others in the design and construction industries. The system is said to allow for overlays of all types of architectural and engineering drawings, space planning, interior design, component costing and graphics presentation displays.

With Aids, designers can create a three-dimensional model of a building. Solids modeling capabilities allow a user to "paint" a computer pic-

Continued on page 74

DOS/VSE and CICS/VS Frustration?**BIM gets it out of your system.**

BIM presents a line of proven programs that maximize your system's capabilities, saving you time, labor and expense. These programs produce help get the most out of your system and people.

BIM-EDF — The editor with more than 25 significant features that EDCP can't match.

BIM-SPC — Prints output in POWER/VSSE accounting queue on local or remote 3270 terminal printers. Processed CP Million Dollar Award 1980.

BIM-SPH — On-line to Batch Print Spooling. Prints data passed from CICS to batch programs, the POWER/VSSE printing queue.

BIM-PDG — POWER Dynamic Queuing performance enhancement. Eliminates 80% of the I/O to heavily used POWER/VSSE queues.

BIM-ODS — Comprehensive problem analysis and display of operational CICS jobs.

BIM-TEXT — Word processing, document composition system. Create formatted documents from free-form input.

BIM-MAIL — Batch mail 3270 374M terminals between multiple CICS partitions without special hardware or additional parts.

BIM-CPD — CICS 3270 data compression system. Reduces response time for screen terminals significantly. Available for OS/VS1 and VS/VS also.

BIM-SPR — Comprehensive CRT screen image print facility. Copy to terminal printer or spool only for system printer.

BIM-SPV — On-line display of history directories and entries. VSAM Catalog entries. Also VTCC's, etc.

BIM-OS — Comprehensive File display. Used by computer operators and programmers.

BIM-SMTH — CICS/VSSE System Status, Performance Measurement, and POWER/VSSE Queue display.

BIM-DEV — Displays Logical Unit assignments for physical devices, to match operational problems.

BIM-SUBMIT — On-line job SDR and Submission facility.

BIM programs are cost-efficient, many less than \$500, highly \$4000. You can save even more with our group package offerings. Products are available on permanent, annual, or monthly license, and shipped on a 30-day try-out basis. Product documentation is available on request.

BIM also performs systems programming consulting, with consultants based in Minneapolis and Washington, D.C. Computer time services are also available on our 3270 system, on-call or remote.

BIM

B I M OYLE ASSOCIATES, INC.
5738 Lincoln Drive
Minneapolis, MN 55426

612-833-3886
Telex 237 880 (BIM US)
Member International Computer Consultants Assn.

Computerworld/Japan can bring your message to the world's second largest computer market.

The Japanese computer industry is growing at a rate of 20% per year. There are currently more than 101,000 installed general purpose computers valued at over \$18 billion.

This figure does not include minis, micros and personal computers. Small business computers are currently the leading growth sector in the Japanese computer market.

Japan is looking for well-developed technology that will meet their future needs. And with no strong indigenous software industry of its own, Japan offers great opportunity for U.S. manufacturers in the packaged software market.

Computerworld/Japan is a weekly publication covering the latest developments in the Japanese computer industry with reports on new products, services and trends. Its 30,000 subscribers include top management and DP professionals throughout the country.

CW International Marketing Services gives you one-stop advertising service in countries around the world. For more information on Computerworld/Japan or any of our other foreign publications, just fill out the coupon below.

Send La Planghe, Manager
International Publications
CSC COMMUNICATIONS, INC.
370 Cambridge Road, Box 800
Framingham, MA 01701
(617) 879-4700

Please send me more information on:

☐ Computerworld/Japan ☐ Your other foreign publications

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____



CSC COMMUNICATIONS, INC.
Publishers of Computerworld and
other leading publications around the
world.

NEW CICS Abend-AID PRODUCT ANNOUNCEMENT

Abend-AID/CICS is a powerful software tool that transfers the burden of debugging CICS transaction abends from the programmer to the computer.

Abend-AID/CICS analyzes transaction abends, determines the cause and tells the programmer—What Happened, Why it Happened and Where it Happened.

It also provides immediately On-Line the necessary supporting data in a concise, easy-to-use format.

activity. Report provides transaction code, terminal, abend code, program name and date/time information for all abends.

Greater Flexibility

- ☐ Exception tables enable you to choose desired output—or suppress output based on transaction code, terminal, abend code or any combination. Customized diagnostic modules can be created for user exits and specialized abend codes.

Saves Programmer Time

- ☐ Complete, easy to understand diagnostics. Pinpoints the cause of the abend. Presents all the data needed to solve the abend. Immediate access On-Line through CICS, TSO/SPF or CMS. The region does not have to be active to view Abend-AID/CICS output.

Reduces Production Downtime

- ☐ Since Abend-AID/CICS is only invoked at the time of the abend it can be used both in test and production. Minimum overhead allows Abend-AID/CICS to work for all regions. Works instantly for all programs old and new. No recompiling. No programmer action required.

Greater Management Control

- ☐ An Abend Activity report can be viewed at any time to give you an up-to-the-minute picture of region abend

For additional Product Information or to arrange for your FREE 30 Day Product Evaluation call today.
800-521-8353 (in Canada or Michigan 313-540-0400)
or return the coupon below to Compuware, Systems Software Division, 32100 Telegraph Road, Birmingham, Michigan 48010.

I want the computer to work for me. Please Send:

- ☐ Additional Abend-AID/CICS Product Information
- ☐ Additional Information on Free 30 Day Product Evaluation.

Name _____ Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____ Operating System _____



Compuware Headquarters
32100 Telegraph Road
Birmingham, Michigan 48010
(313) 540-0400

COMPUWARE



International Offices: New South Wales, AUSTRALIA Phone (61 2) 816 1177 / Lakes, Bedfordshire, ENGLAND Phone (44 960) 28 463 / Paris, FRANCE Phone (33 1) 624 1388 / Milan, ITALY Phone (39 2) 543034 / Herlev, DENMARK Phone (45 72) 50 5812 / Tokyo, JAPAN Phone (81 3) 475 1600 / Oslo, NORWAY Phone (47 22) 56 1070 / Singapore, SOUTH AFRICA Phone (27 11) 957 5802 / Amsterdam, NEDERLAND Phone (49 20) 23 3201

SOFTWARE & SERVICES

Continued from page 72

ture of a proposed project.
A single workstation license for Aids is priced at \$7,000; a license for two or more workstations is priced at \$14,000.

Arcad, 445 S. Figueroa St., Los Angeles, Calif. 90071.

DATA BASE MANAGEMENT SYSTEMS

DATA ADMINISTRATION, INC. Data-Mapper

Data Administration, Inc. has announced the Data-Mapper package, which is said to be a tool for data analysts, data modeling and logical

data base design.

The package, designed for use with IBM OS and compatible processors in the IBM OS environment, is said to let users analyze data contained in Cobol source code libraries and data dictionaries. The system can identify data entities within existing systems and tell where the data is used, how often it is used and what the relative importance of the data is.

The package features automated affinity analysis of the commonality of data among existing application systems and subject data base analysis capabilities that assist users in evolving from application-oriented files to subject-oriented files.

Data-Mapper is licensed for \$7,500.

Data Administration, Suite E, 640 Strander Blvd., Seattle, Wash. 98108.

USERWARE INTERNATIONAL Version 4.0 of User-11

Userware International has announced Version 4.0 of its User-11 system for Digital Equipment Corp.'s RSTS/E operating system.

User-11 is a dictionary-driven data base management system and applications development system. Version 4.0 features a select and sort package developed by Evans, Griffith & Hart, Inc. that is said to speed the sort operation. Additional enhancements include greater control of system security.

User-11 is also available for DEC's VMS and CTS 500 operating systems, and it is priced between \$7,500 and \$27,000, depending on CPU type.

Userware International, 2235 Meyers Ave., Broomfield, Calif. 80075.

ON-LINE DATA BASES

AMERICAN CHEMICAL SOCIETY

ACS Journals Online evening service

The American Chemical Society (ACS) has announced that its ACS Journals Online is available for evening and nighttime use.

According to the vendor, the service is a simplified version of the regular online program that allows chemists, engineers and other users of chemical information to conduct their own searches.

The service is available from 6 p.m. (user's local time) until 4 a.m. EST and costs \$11/connected hour.

ACS, 1155 16th St. N.W., Washington, D.C. 20036.

ILLS

From page 67

language as "the foundation for large, transaction-oriented systems," the study indicated that they may play an important role in improving the systems development process. Prototyping using fourth-generation languages allows users to discover fundamental problems quickly. Also, the survey reported, users remain involved in the entire process of systems development because the fourth-generation language serves as a communications medium between end users and the information systems staff.

Input predicted that micro versions of fourth-generation-language products will offer information systems departments "many attractive options" that were not available in the past. Those options include:

- Linking mainframes and micros such that applications can be developed and run on "whatever machine media makes sense at the time."

- "Prototyping and developing fourth-generation-language applications on the micro or in the information center environment and migrating them into a production environment."

FOURTH

From page 67

tion languages have more positive than negative factors impelling their use."

The changing environment brought on by increased fourth-generation-language use may have a major impact on information systems staff. Many "journeymen" Cobol programmers will be "deskilled," input cautioned, as fourth-generation-language users with recent experience outperform them. But the period of flux presents the information systems department with the opportunity to "restructure, align and integrate" itself more closely with the rest of the corporate organization.

The report envisioned a scenario in which applications programmers and analysts would become a "corporate resource," with a common resource pool and personnel transfers between information systems and other areas. Such a structure would strengthen the information systems division by giving it access to a more diversified personnel pool, the survey said.

Opportunities of Fourth-Generation Languages is available for \$1,800 from Input, 1943 Landings Drive, Mountain View, Calif. 94038.



IT'S WHEN NO ONE KNOWS THERE'S BEEN ONE. Computer crime is 10 times more profitable than robbing a bank. That's a fact. But, this statistic is only available on KNOWN computer crime...it's impossible to know how much monetary and informational theft goes undetected; some of it, perhaps, from your own system. The ability to access computers via dial-up ports is beneficial, but it creates a potential exposure akin to leaving the vault door unlocked.

Disgruntled employees, strikers, malicious hackers and dishonest competitors can obtain information, vandalize the system, even misappropriate inventory...all from a push-button phone.

This high-risk threat of computer fraud has generated the urgent need for the LeeMAH Secure Access Multipoint (SAM). SAM reduces your system vulnerability by allowing access to AUTHORIZED LOCATIONS ONLY via callback. SAM connects on the analog side of the modems. You can stop the perfect crime...with LeeMAH's SAM.



SAM also:

- Interfaces with any modem, any speed, any protocol.
- Provides audit trail including unauthorized access attempts.
- Has simultaneous multi-call handling capability.
- Is modular for both port and call-back directory capability.
- Masks computer from unauthorized callers.
- Up to 64 ports per system.



LeeMAH

729 Filbert Street San Francisco, CA 94133 Telephone: 415-434-3780

COMMUNICATIONS

GTE Telenet touts advances in high-speed packet switches

By Bryan Wilkins
CW Washington Bureau

VIENNA, Va. — GTE Telenet Communications Corp. has introduced two packet switches that it claims are "a quantum leap in network processor design," since they will permit data communications at speeds of 1,200 and 2,400 packet/sec.

The TP 4200, which can handle up to 1200 packet/sec, a capacity four times greater than previously available switches, is based around a new CPU unit with increased random-access memory and new Telenet processor operating system software. The TP 4800 employs two CPUs designed to co-process data volumes at 2,400 packet/sec.

GTE Telenet said that both switches are continuations of its 4000 product line.

The TP 4200 is available immediately and is priced at \$49,000 for the basic unit; there are additional charges for installation, maintenance, network management and programming. No price is currently

available for the TP 4800, which will not be available until the third quarter, according to John Holmblad, Telenet's marketing and network engineering director.

Raj Kanodia, director of product planning for GTE Telenet, said that the two new products, as well as upgrades to the existing 4000 packet-switching system that are being introduced at the same time, will permit the development of private citywide and local-area networks.

Telenet also plans to introduce early next year the Packet Exchange Bus, which will permit the interconnection of several co-located packet switches using 10M-bit local-area network technology.

Holmblad added that GTE Telenet intends to market the TP 4200 and the TP 4800 to local exchange telephone companies that are looking for a data communications capability.

Information is available from GTE Telenet, which is located at 8229 Boone Blvd., Vienna, Va. 22180.

User installation a key feature of Wang Fastlan

By John Elin
CW Staff

Admitting that many users are not ready to commit to installing a pre-missile local-area network, Wang Laboratories, Inc. recently introduced a user-installable local network targeted at small and medium-size organizations or large organizations interested in expandable starter networks.

Fastlan is said to be compatible with and to offer the same capabilities as Wangnet, the company's broadband local-area network, but to support fewer users. Within a radius of 300 ft, the network reportedly can be configured with four to 640 ports, compared with Wangnet's ability to support between 5,000 and 30,000 devices.

While Fastlan is similar to Wangnet in configuration and function, it uses a lighter, more flexible type of coaxial cable (dual BNC-11) and doesn't require the design review and certification procedures typical of the higher capacity network.

Network components include: Fastlan-A, a 8006 radio frequency amplifier that serves as a "network cop"; Fastlan-B, a 8350 device that is connected to the central amplifier and supports cable "branches"; and Fastlan-C, drop cables that hang off the branches and, at \$130 each, support four port outlets.

Fastlans can be interconnected, when and if needed, with a backbone Wangnet. Like Wangnet, the bandwidth of the broadband Fastlan is subdivided into individual bands to meet certain applications. Fastlan features:

- Wang Band — a 10M bit/sec channel that uses the Carrier Sense Multiple Access with Collision Detection (CSMA/CD) access method to support a maximum of between 50 and 100 Wang VS, OS and Alliance computer systems.

- Peripheral Band — a number of channels operating at 4.57M bit/sec used to connect up to 600 polled Wang workstations and peripherals to devices on the Wang Band.

- Interconnect Band — switched and dedicated channels divided by frequency

See Wangnet page 78

Honeywell introduces Ethernet links

PHOENIX — Honeywell, Inc. recently introduced hardware and software systems that enable users to interconnect Honeywell's large and small computer systems and peripherals via a Xerox Ethernet Version 1.0 or IEEE 802.3 local-area network supporting the Xerox Network System high-level protocols (ISO Levels 3 to 5).

The products include three network communications servers and two gateway servers that provide access to long-distance communications devices, the company reported.

The products are said to be compatible with the company's Distributed Systems Architecture (DSA) as used with its DPS 86 and DPS 8 large-scale computers, DPS 6 small systems and micro systems 6/10 and 6/20, a company spokesman said.

Communications servers include the CS/100, CS/1 and CS/1-X-35.

■ The CS/100 is a 10-port communica-

tions processor for asynchronous devices that can function as a terminal service, cluster controller and/or interface between the local-area network and computer systems.

It is supported by the DPS 6 small computer systems operating under Honeywell's Gcos 6 Model 400 and by two models of its Datatnet network processor systems — the Datatnet 8, running Distributed Network Supervisor operating software; and the Datatnet 6600 series, operating under Honeywell's GRTS, GRTS-II, Network Processing Supervisor or Multics Communications System, the vendor said. The price is \$4,000. There is a one-time license fee of \$100 for the CS/100 operating system software.

■ The CS/1 is a larger version of the CS/100 model. It reportedly can connect up to 32 ports (asynchronous and/or synchronous) to an Ethernet network and

See CS/1 page 78

INSIDE

Controllers/78

Voice/Data

Communications/76

Software/78

Multiplexers/

Modems/77

Local-Area

Networks/77

Auxiliary

Equipment/77

Test Equipment/78

300 BAUD

103A COMPATIBLE

MODEMS

WITH ALL THE FEATURES YOU NEED

1200 BAUD

212 A COMPATIBLE

FULL X-25, X-21, X-22, X-23, X-24, X-25, X-26, X-27, X-28, X-29, X-30, X-31, X-32, X-33, X-34, X-35, X-36, X-37, X-38, X-39, X-40, X-41, X-42, X-43, X-44, X-45, X-46, X-47, X-48, X-49, X-50, X-51, X-52, X-53, X-54, X-55, X-56, X-57, X-58, X-59, X-60, X-61, X-62, X-63, X-64, X-65, X-66, X-67, X-68, X-69, X-70, X-71, X-72, X-73, X-74, X-75, X-76, X-77, X-78, X-79, X-80, X-81, X-82, X-83, X-84, X-85, X-86, X-87, X-88, X-89, X-90, X-91, X-92, X-93, X-94, X-95, X-96, X-97, X-98, X-99, X-100

INTEGRAL OR EXTERNAL T.1 HALLWAY

SEVERAL MODULAR TELEPHONE

CAN BE USED ON DIAL NETWORK

OR TWO WIRE PRIVATE LINE

IT HAS MANUAL ORIGINATOR ANSWER

SWITCH, 103A IN ORIGINATOR ONLY

□ MODEL 305E2-12

\$147

□ Acoustic Couplers □ Modems □ Line Drivers □ Accessories
□ Statistical Multiplexers □ Protocol Converters

COMDATA

Please check items of interest and return to us for additional information:

7600 N. Hague

Morton Grove, IL 60053 New York

212/678-6800

Los Angeles

213/678-6800

212/678-6800

212/678-6800

name _____
company _____
street _____
city _____ state _____ zip _____
telephone _____

□ MODEL 212E2-32

\$377

COMMUNICATIONS

CONTROLLERS

ACUTREX CORP.
Autolink Intelligent I/O Processor

The Autodata Division of Acutrex Corp. has announced the Autolink Intelligent I/O Processor, a front-end processor.

When the computer attached to the Autolink is down or off-line, the device is said to be capable of acquiring, processing and storing data for later use.

Additionally, Autolink performs continuous or interval monitoring with the capability to handle up to 60 local channels and up to 256 remote channels of I/O. Remote user programming is accomplished via the standard RS-232C port, a company spokesman said.

The price is \$2,200. Acutrex, 555 Clyde Ave., P.O. Box 7555, Mountain View, Calif. 94039.

VOICE/DATA COMMUNICATIONS

ARTEL COMMUNICATIONS CORP.
CV108

Artel Communications Corp. has announced a fiber-optic communications system designed for use in computer-aided design and manufacturing (CAD/CAM) applications.

The CV108 connects ComputerVision Corp.'s graphics processors with its Instaview C color workstations that are located farther than 100 ft from the computer.

A basic system consists of two rack-mounted card modules at the processor, a small tabletop modem at the workstation and the interconnecting four-fiber cable. The price is \$10,000.

Artel Communications, P.O. Box 100, West Side Station, Worcester, Mass. 01602.

LEGIST AUTOMATION, INC.*Maple Series IV*

Legist Automation, Inc. has announced the availability of its Multiple Asynchronous Protocol Simulator (Maple) for users of Four-Phase Systems, Inc.'s Series IV computers.

The product reportedly allows any user at a Four-Phase terminal to simulate an Arcl terminal and access remote systems supporting such terminals.

Maple uses the Four-Phase 9450 multilane asynchronous communications controller to support up to four concurrent users from any of the thirty-two terminals available on the Four-Phase processor, a company spokesman said.

Additional features in-

clude: line speeds to 4,800 bit/sec; two- or four-wire, dial or leased-line support; and modem dialing sequences and auto-logon, including dialog with local-area networks or packet-switched networks, according to the vendor.

The price for the first system is \$2,800, the spokesman said.

Legist Automation, 1212 Millbrook Drive, Arlington, Texas 76012.

SOFTWARE

HAWKEYE GRAFIX
Enhancements for Comux

Hawkeye Grafix has announced feature and facility enhancements for Comux, its communications exchange software program.

Version Nine of the product includes enhancements for faster data transmission, emulation of a greater number

of terminals and menu-driven intelligent modem installation facilities, the vendor said.

The Comux communications software is used for access and data transfer with mainframes, time-sharing services and data base services, in addition to Western Union's Telex, the U.S. Postal Service's electronic computer-originated mail and micro systems, according to a spokesman for Hawkeye

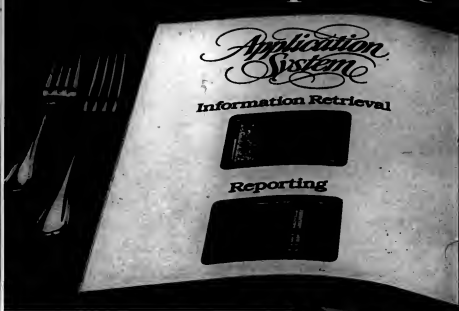
Grafix.

A new technique called Stripex enables direct-connect file transfers between computers with different disk sizes, formats and operating systems, the company spokesman said.

The price is \$90. Updates for current users are priced at \$45, according to the vendor.

Hawkeye Grafix, 25014 Mobile, Canoga Park, Calif. 91307.

IBM computing



What computer service do you need today? Information retrieval? Planning systems? Color graphics? Text processing?

When you connect a terminal to the IBM Information Network, a keystroke orders up exactly the remote-access service that can help you.

One of these services is Application System (AS), a computing resource for executives and business professionals. It helps you collect and retrieve information. Organize it to your liking. And display it in color-graphics or table form. Application System uses English-like com-

mands, which make it especially simple to learn and operate.

Now everybody in your company who uses AS can work with one system, which integrates a wide range of business functions. And people in dispersed locations can communicate through the system, sharing information with one another. Everybody in your organization can be more productive and more effective.

The Low-Risk Way

The IBM Information Network is an extremely economical way to meet individual

COMMUNICATIONS

MULTIPLEXERS/
MODEMSFIBRONICS
INTERNATIONAL, INC.
Model FM 1600

Fibronics International, Inc. has announced an 8-port coaxial cable multiplexer designed for users of Memorex Corp. controllers.

The Model FM 1600 multiplexer operates with the Me-

morex 2074 controller and all Memorex Category A peripherals, a vendor spokesman said. The FM 1600 enables peripherals to be up to 4,000 ft from the host controller. In turn, each peripheral can be separated by 1,000 ft from the FM 1600, the spokesman said.

The multiplexer costs \$2,500 per pair.

Fibronics International, 315 W. Main St., Hyness, Mass. 02601.

LOCAL-AREA
NETWORKSEXCELAN, INC.
Rase 200 series

Excelan, Inc. has introduced the Rase 200 series of Ethernet front-end processors.

The series is composed of four products: The 201 is Intel Corp. Multibus-compatible and supports 30- and 34-bit host memory addressing;

the 202 is VME-bus-compatible, supports 34-bit host memory addressing and provides a 6-bit address modifier; the 203 is Q-bus-compatible and provides both 18- and 22-bit memory addressing; and the 204 is Digital Equipment Corp. Unibus-compatible and supports standard 18-bit memory addressing, a company spokesman said.

All 200 series Ethernet front-end processors are compatible with Xerox Corp.

Ethernet Versions 1.0 and 2.0 and IEEE 802.3 standards, the vendor said.

With 128K bytes of random-access memory, the 200 series is priced as follows: The 201 costs \$2,100; the 202 is priced at \$2,800; the 203 costs \$2,770; and the 204 is priced at \$3,820.

Excelan, 2180 Fortuna Drive, San Jose, Calif. 95131.

AUXILIARY
EQUIPMENT

DATANEX, INC.

Hasp+

Datanex, Inc. has announced support for Digital Equipment Corp.'s DMP22 and DPV11 interface devices through its Hasp+ software.

A general-purpose workstation software package, Hasp+ reportedly allows DEC's PDP-11 and VAX computers to communicate with a broad range of different computers and networks.

Support for the DMP22 brings VAX users' communications speeds from 2K bit/sec to 56K bit/sec. The DMP22 also includes direct memory access transfers for a line printer and eight asynchronous lines.

Support for the DPV11 communications board is provided through the same Hasp+ package and allows support to Q-bus PDP-11s at speeds up to 56K bit/sec, depending upon the processor. The software package, including support for the DMP22 on VAX systems, costs \$5,500. PDP-11 prices range from \$1,995 to \$5,000.

Datanex, P.O. Box 1728, Eugene, Ore. 97440.

GENERAL SYSTEMS
CENTER, INC.

Model 1000 tape controller

General Systems Center, Inc. has announced the Model 1000 communicating tape controller for tape-to-tape and tape-to-host communications.

The device reportedly permits off-line communications between standard formatted tape systems or on-line communications to a host computer system over dedicated or leased lines with guaranteed data security.

Operating at selectable data rates up to 56K bit/sec asynchronously or 10.2K bit/sec synchronously, the controller is designed for use with existing data communications systems.

File handling features of the product include Ascii/Rhodic conversion, variable record lengths, space compression in transparent or nontransparent mode and unattended autoanswer mode. The controller costs \$2,800.

General Systems Center, 25 Connershore Road, Centerport, N.Y. 11721.

à la carte.

Business Graphics

Planning and Forecasting

Project Control

needs for computing services and to get the full benefit of IBM expertise, service and support.

If you have an in-house computer, the IBM Information Network can complement it. The Network provides a fast, low-risk way to try innovations like Application System.

Let us serve you more detailed information about Application System and the IBM Information Network. Simply call 1 800 IBM-2468, Ext. 90.

Or return the coupon.

IBM

IBM Information Network

IBM Information Network
P.O. Box 3004/90
Tampa, Florida 33630

4-30

- ☐ Have a marketing representative contact me.
☐ Send information on IBM Information Network products and services.

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Phone _____

Fax _____

Stuff it to JES

Give your CICS, DSEPRINT and IMS reports to JES The Dynamic Report System provides a bridge between on-line systems and the JES report queues. Instead of burdening CICS and IMS with printing, move it to JES and gain performance along with centralized report distribution. Let JES account for, archive and distribute reports to 327X printers, local printers, PCs, plotters, microfilm devices and S210s.

And Let JES Distribute Your 326X Reports

VPS, the VPM/TCAM Printer Support subsystem places 326X/326X printers, PCs, plotters, S210s, and word processors directly under JES. These non-dedicated devices become JES print stations. VPS expands JES's local and remote hardcopy alternatives as it reduces real network costs and complexity. Ask our 400 users and their 20,000 printers.



Lavi, Ray & Shoup, Inc.
P.O. Box 18229 - Dallas, TX 75218
(817) 342-2222 • TWX 214-222-4224

MICRO-TERM
Introduces the New

ERGO® 4000

**A 66-Line
Word Processing
Terminal
for Only
\$1195**

Quantity Discounts Available

The ERGO 4000 is a 66-line word processing terminal that can be used for text editing, document preparation, and data entry. It features a built-in printer and a 100,000 character memory. The terminal is compatible with a wide range of word processing software, including Microsoft Word, Lotus SmartSuite, and WordPerfect. It is a cost-effective solution for small businesses and individual users.

The ERGO 4000 word processing package is designed to run on the IBM PC or compatible hardware. It offers a variety of features to enhance productivity, including spell checking, grammar checking, and a thesaurus.

WordStar	Saturn
Lotus	Spellbinder
Multi	Supervue
PageText	Wordstar
Desktop Writer	TEXT

For more information, call 1-800-4-A-WORD or write to Microterm, Inc., 10000 Westpark Drive, Dallas, TX 75243.

Terminals are our only product, and we put more into them.



Attn: 112 Rudder Road, Fenton, St. Louis County, Missouri 63025
314-111-1115 TWX 9107601862 MICROTERM STL

TEST EQUIPMENT

DYNATECH DATA SYSTEMS

Simon 5

Dynatech Data Systems has introduced a protocol simulator/monitor that incorporates a hard disk.

The Simon 5 can reportedly handle all standard protocols, including X.25, X.21, Synchronous Data Link Control and Binary Synchronous Communications, in a monitor capacity or interactively. It can be used to simulate data terminal devices to analyze network performance or to simulate a network to study the performance of terminal devices.

Dynatech said that the device's 5M-byte removable hard disk enables users to capture large samples of

data on which to perform analysis.

Another key feature is the Simon 5's plug-in interface modules. The device's RS-232 interface can be directly replaced with V.35, X.21 or RS-449 interfaces. Simon 5 costs \$17,850.

Dynatech, 7644 Dynatech Court, Springfield, Va. 22153.

CS/1 from page 75

may include host communications channels. The price is \$10,395. The operating system software for CS/1 is priced at \$210.

■ The CS/1-X.25 communications server supports up to four ports to connect Honeywell's information processors to the local-area network, using the CCITT X.25 interface. The interface allows multiple virtual circuits to be supported over each physical connection in conjunction with an X.25 packet assembler/disassembler and supports DCA file transfer. The price of the CS/1-X.25 is \$11,025. The one-time software license fee is \$3,150.

Gateway servers include the OS/1 and OS/2.

■ The Gateway Server 1 (OS/1) interconnects two or more local-area networks via X.25-based public data networks, allowing the integration of local and long-haul network communications. The OS/1 supports a maximum of four ports. The price is \$11,025. The operating system for the product costs an additional \$2,100.

■ The Gateway Server 3 (OS/2) is a point-to-point server that interconnects two or more local-area networks using communications media, which include fiber-optic and microwave links, a company spokesman said. OS/2 supports up to eight ports. The price is \$10,395. The license fee for the operating system software is \$158.

More information is available from Honeywell through P.O. Box 8000/T-60, Phoenix, Ariz. 85066.

WANG from page 75

and used to establish connections between devices with industry-standard communications interfaces and protocols.

■ Professional Computer Service Band — four channels that can be used to connect up to 256 Wang micro at 2.5M bit/sec using a modified token-passing access method.

■ Utility Band — providing seven CATV-standard video channels that can be used for videoconferencing or in an energy management capacity.

Channels in the Interconnect Band operate in either a switched or dedicated mode. Switched speeds supported range up to 9,600 bit/sec, are terminated with RS-232 interfaces and require the use of a \$1,260 frequency-agile radio frequency modem. Dedicated channels use RS-449 interfaces and can be operated at 9,600 bit/sec or 64K bit/sec and use fixed-frequency modems that cost \$850 and \$1,260, respectively.

Other interface devices available with Fastlan include a \$1,600 network multiplexer, which enables up to eight devices to be connected to the network through a single net port, and the Cable Interface Unit, a \$3,800 device used to connect Wang systems to the Wang Band.

Wang is located at One Industrial Ave., Lowell, Mass. 01851.

IS YOUR MAINFRAME HOLDING BACK FINANCIAL INFORMATION?

DATA GENERAL'S NEW COMPREHENSIVE FINANCIAL OPERATIONS GETS YOU INFORMATION FASTER

If your mainframe's overloaded, it can take days or even weeks for decision-makers to get key financial information.

You need Data General's Comprehensive Financial Operations, our financial software package with mainframe capability that runs on a mini-computer, and is truly integrated.

In conjunction with Data General hardware, it can help distribute financial information where it's needed—to both local and remote offices.

Data General's system has all the financial functions of the most sophisticated mainframe software: general ledger, accounts payable, purchase order, materials management & inventory control, and accounts receivable.

INTEGRATED AND INTERACTIVE SYSTEM

And, unlike most other accounting software packages, Data General's entries are recorded

immediately throughout the system, not batch processed. The result: timeliness of information, increased productivity, improved financial control and reduced costs.

INTEGRATED WITH CEO® OFFICE AUTOMATION

With Data General's Comprehensive Financial Operations, you can add the capability of our CEO system any time—with all the benefits of integrated office automation.


And of course, with Data General, you only deal with one source for both hardware and software service.

CALL NOW

For complete information on Comprehensive Financial Operations, call 1-800-554-4343, Operator 05H, or write:
Data General, M.S.
05H, 4400
Computer Drive,
Westboro,
MA 01581.

























CEO is a registered trademark of
Data General Corporation.

Copyright 1984 Data General Corporation, Westboro, MA

 **Data General**

a Generation ahead.

Only MSA software makes your mainframe work 100 times better

					
1. New MSA's Executive Peachpak™ II software links personal computers to the mainframe. So you can...	2. Use your PC to access all your MSA mainframe systems, from General Ledger to Manufacturing.	3. Access entire mainframe files, so you can work with large amounts of information at one time.	4. Get HELP if you need it, with a built-in feature that guides you through the system.	5. Choose the exact mainframe information you need, as much as you need, to the form you need.	6. Use it with Peachtree Software, 1-2-3™ from Lotus, dBase™, VisiCalc™ or other micro software.
					
7. Enjoy a real-time environment, no waiting for processing.	8. Allow only authorized personnel access to the equipment, due to built-in security.	9. Get database-to-database transfer with Database Sharing.	10. Use over 20 pre-installed applications from MSA. For example...	11. Use PeachLink™ to download information from both MSA and non-MSA online mainframe systems.	12. Download vendor history from MSA's Accounts Payable System and use PeachCalc™ to do comparative analysis.
					
13. Print checks to remote locations from mainframe Accounts Payable data.	14. Create a salary administration worksheet on a PC using MSA's Payroll Personnel System.	15. Make a purchase order adjustment without leaving your workstation.	16. Download current balance from General Ledger to graph actual vs. planned.	17. Capture data from MSA's Payroll System, use PeachCalc™ to create a basic reimbursement model.	18. Access available funds data to MSA's Budgetary Control System...
					
19. Use PeachCalc™ to project expenditures through year-end.	20. Use MSA's Manufacturing System data to produce cost/budget analysis with PeachCalc™.	21. Dial up subscriber database to access current credit information for customers...	22. Use PeachCalc™ to analyze information, set credit and update your mainframe Accounts Receivable data.	23. Install it to free data over links.	24. -300-

Send for our free brochure, and find out all 100 ways to increase your productivity.

Backlogs? Rush requests? Now they're a thing of the past.

MSA's new Executive Peachpak II links your company's personal computers directly to your mainframe. So executives can get to vital information without waiting for print-outs.

Best of all, this hot new technology is available from MSA right now (in fact, it's already installed and working for companies across the country).

MSA is the mainframe-to-micro leader. While other companies are still trying to work the bugs out of their initial offerings, MSA already has its award successful mainframe-to-micro product: Executive Peachpak II.

It offers such advanced features as Database Sharing. MSA's database-to-database transfer technology that lets you get all the mainframe information you need instantly.

And a Universal Interface with most micro-software packages including Peachtree Software, 1-2-3™ from Lotus, and VisiCalc™. Executive Peachpak II also includes PeachCalc™,

an electronic spreadsheet. A Business Graphics System for color charts and other graphics. Telecommunications that let personal computers talk to each other—or link to resources such as Dow Jones News/Retrieval® PeachLink™, complete report production system that lets executives edit and footnote reports. A List Manager for organization. And PeachLink™, the software that links your PCs to the mainframe.

This mainframe-to-micro technology is also available in two other packages.



ages. Administrative Peachpak, which includes comprehensive word processing functions. And Graphics Peachpak, for color graphics and charts.

All include PeachLink™. And all are backed by the service and support MSA is so famous for.

This revolutionary new link means you can now deal with one software company that supplies all the advanced mainframe systems your company needs. All the software for your personal computers through our Peachtree Software Company. And the software that links them together.

Talk to MSA about new Executive Peachpak II. And see how much more you could be getting from your mainframe. Call Robert Carpenter at (404) 239-2000, or write to Management Science America, Inc., 3445 Peachtree Road, N.E., Atlanta, Georgia 30326.

MSA
The Software Company

MSA makes the mainframe link to personal computers a reality

Executive Peachpak II and PeachLink are trademarks of Management Science America, Inc. PeachCalc and Peachtree are trademarks of Peachtree Software, Inc. and MSA America dBase is a trademark of Software Arts, Inc. 1-2-3 is a trademark of Lotus Development Corp. VisiCalc is a trademark of VisiCorp, Inc. Dow Jones News/Retrieval is a registered trademark of Dow Jones & Company, Inc.

SPECIAL REPORT

Micros in big business



A different kind of game

April 30, 1984

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Untapped marts abound for future micro use

By Tom Ichniowski
CI Staff

In less than five years, microcomputers have risen out of relative obscurity to become a pervasive part not only of many corporations, but also of society. What has been called the microcomputer explosion is still exploding. Users are making such high demands on microcomputers that even the most innovative vendors are having trouble keeping up with the rapidly expanding market. In some cases, even the technologies currently being used in micros are being challenged by performance-hungry users.

If the bubble of the expanding microcomputer market is destined to burst, most industry watchers believe the big pop will not happen any time soon. Instead, they predict the users' demand for micros will keep on expanding at both the high and the low end. And there are many new markets for micros that have yet to be tapped, such as those for vertical markets and specialized systems.

But while the future for micros appears rosy, corporations using them will remain faced with some nagging problems, such as security, networking, training and managing the expanding corporate information resources.

Industry analysts seem to disagree on how microcomputers will be used in the next few years. Aaron Goldberg, a research manager with International Data Corp. in Santa Clara, Calif., contends that most micro users will break out of the traditional stand-alone environment and begin working with other systems. Goldberg said these other systems may be other micros, linked via a local-area network, or mainframe processors using specialized software aimed at helping nontechnical users slice

There are many new markets for micros that have yet to be tapped, such as those for vertical markets and specialized systems.

But while the future for micros appears rosy, corporations using them will remain faced with some nagging problems, such as security, networking, training and managing the expanding corporate information resource.

through the complexities of mainframe processing.

But Kenneth Bosomworth, president of International Resources Development, Inc. in Norwalk, Conn., notes that at least for the near future, "70% to 80% of corporate users will not use any communications at all." Bosomworth added that the remaining 20% to 30% of corporate users will demand at least per-time access to larger data bases, while traditional users of dumb terminals, such as programmers and researchers, may wind up keeping those terminals connected directly to a large system.

The supermicrocomputers

One late trend in the microcomputer marketplace has been the so-called supermicrocomputers. Typically, these systems support multiple users and are based on higher performance 32-bit microprocessors.

According to a recent report published by Electronic Trend Publications in Cupertino, Calif., supermicrocomputers (or microminicomputers) will probably overtake the processor market commonly held by minicomputers. For multistep applications, noted the report's author, consultant Andrew Allison, supermicro often present a more powerful and more economical solution than

older technology minicomputers.

But the way the microcomputer market is developing, Bosomworth said, supermicros may wind up being a flash in the pan. Bosomworth noted that he expects memory and processors to become so inexpensive that it may not be necessary to have one processor to accommodate several users.

Software systems

Sandy Gant, a senior analyst with the Cupertino-based market research firm Infocorp, noted there will always be applications that require several users to have access to the same data. For that reason, Gant said, supermicros may wind up being used more as file servers than as stand-alone multistep systems.

Linking microcomputers to mainframes has received a lot of attention, Gant said, but relatively few users are actually using the technique. In fact, Goldberg added, connecting micros to mainframes poses some problems that may be difficult to overcome.

For example, while many companies have developed software that allows users of IBM's Personal Computer to access larger IBM mainframe host processors, using the data in the mainframe can be difficult. Goldberg

noted that few corporate executives are willing to learn how to use mainframe systems software, such as IBM's CICS and TSO, in order to reap the benefits of mainframe data. Bosomworth added that the solution to that problem is to develop additional software to make accessing mainframe data bases much easier for novice users.

Vertical market gold mine

Finally, all of the industry watchers contacted recently said there is a potential gold mine in vertical markets for microcomputers.

Vertical markets are markets for which vendors develop specialized products. For example, a vendor might develop a set of software packages to manage a dentist's office or a construction company. Mystronically, Infocorp's Gant said, vertical markets for micros have not developed as strongly as many had anticipated.

One possible reason, IDC's Goldberg pointed out, is that many novice users fail to understand the concept of a turnkey system — one in which the vendor sells both the hardware and the software for a specific application.

But Goldberg also noted there is so much microcomputer software currently on the market that it is getting more difficult to make the right selection.

"The pitfalls of micro software selection can be amazing," Goldberg said. "You can get into deep trouble." Consequently, he added, more users will be looking for integrated software packages that will solve their unique business needs while offering the option to gain other benefits of microcomputing, such as word processing and electronic mail.

Goldberg is senior editor for systems and peripherals at Computerworld.

INSIDE

Surmounting micro incompatibility a must/585

Integrated link with windowing, flexibility urged for micro-mainframe communications/586

Bank uses micro net for overseas audits/587



Is 1984 the year for multistep micro systems?/588

Service options for micros: Choosing the plan, vendor that best answers user needs/589

Micro blunders: A few infamous fables/591

Firm tags DPer to ride herd over micros/592

Touch screens touted for giving managers quick data access/593

Touch offers variety of technologies/595

Maintenance: Consider independent service/597

Leasing micros provides support solution/598

Electric firm sheds light on its business with micro modeling techniques/599

Lack of control of micro DP leads to choice/599

Mainframe ties signals end of stand-alone micro/599

Risk management policy: Planning for the day when it doesn't happen to the other guy/594

Cable-connected micros come to the rescue/596

Micro's future need in mainframe past/597

Insurer secures productivity with micro plan/598

Broadcasting system tunes in multistep micro/599

Mainframe conversion leads firm to micro link/599

Info resource management aids data security/599

Headache or savior: Organizing micro power/599

Sperry faces the music, attunes its managers to linked microcomputing/599

Developer employs creative partnership to smooth path for micro use/599

Micro users looking for mainframe power/599

Sci report gets lift from reservation system/599

Spreadsheets save broken data entry time/599

Technology sees micro users toward DCP/599

Micros worth little without communications/599

Voice technology coming for microcomputers in 1984/599

Microcomputer users consider new use of Cobol implementation/599

Networked DBMS: More than one plus one/599

Micro software on mainframe widens choice/599

Abundant applications beguile new users/599

Coming handles micro installation like glass/599

Micros as turnaround time for forestry service/599

Surmounting micro incompatibility a must

Cultivation of long-range plan seen paramount for business

By Theodore T. Eggle
Special to CWR

The proliferation of low-cost microcomputers within big businesses has been both a boon and a curse. The incompatibility arising from the piecemeal introduction of micros is a problem that many companies are now facing.

On the positive side, the introduction of microcomputers to all facets of business resulted in significantly increased computer literacy. Never microcomputer users, outside the traditional data processing center, began to make more realistic assessments of the complexity of programming tasks and the time frames required to accomplish them. Increased exposure to the personal and professional microcomputer at work and at home resulted in the acceptance of the computer and its adoption for everyday tasks. This use eventually resulted in productivity increases and better understanding of business operations.

On the negative side, the introduction of microcomputers within a large business has rarely been a planned activity. Piecemeal introduction was a direct result of the low cost of personal computers. Entry-level microcomputers with purchase prices under \$5,000 seldom required the high-level management review and approval routine that is standard for capital purchases of mainframes and minisystems.

Reasonable upgrades

Microcomputers also could immediately be upgraded with additional memory, disks, other peripherals and software without further review or notice. After all, spending another few hundred dollars at a time "to make the computer do what we want it to do" seemed reasonable. It was certainly preferable to scrapping the product, buying a new computer or going to a central DP center for help. Small initial expenditures often grew into large total expenditures of time and money as microcomputers were upgraded and as special software was developed for a particular application.

Both the microcomputer brand and the configuration would often differ at each installation. This resulted in part from the different microcomputer vendors choosing to target different markets and in part from individual user preferences.

A single department might use several different incompatible brands of microcomputers. The software run on these systems would seldom be the same, even if purchased rather than developed internally. Neither the hardware nor the software would be compatible. The diskette or tape media often would not be transferable among systems, making that mode of data exchange impossible.

The result of a mixture of incompatible microcomputers within a large business leads to several problems, including:

- Lack of compatibility between systems — hardware, software, media
- Duplication of effort. The same

programs are written several times for different systems.

- Poor documentation of software.
- Difficulty in tracing discrepancies or in comparing results obtained on different systems using different software and algorithms.
- High support costs due to a multiplicity of equipment and lack of companywide maintenance agree-

Alternative solutions should be evaluated in light of future microcomputer requirements throughout the company. These requirements may be determined separately from the inventory. They should be categorized as mandatory, desirable and blue-sky wish lists, and time frames must be estimated. This information is used for future planning as well as for comparison with current activity

While it may seem that the selection of a single microcomputer model and configuration, along with a single choice of software, would be the best [incompatibility] solution, it is doubtful that such a solution will be satisfactory in any large business or over an extended period of time. No single product yet satisfies all the divergent needs of a large company. The goal is to minimize the number of different systems within the company while allowing for future growth and expansion and to satisfy all of the real needs of the different groups within the company.

meats.

■ Obsolete or unused hardware and software accumulated after the only person understanding how to use it has left the group or the vendor furnishing it has quit manufacturing and supporting it or has even gone out of business.

Requires long-term project

Changing that situation is a long-term project.

The first step is to take an inventory of all microcomputers in the company. Do not rely only on existing inventory lists from accounting or purchasing. Some companies have found that fewer than half of the microcomputers actually being used show up on lists of capital equipment and official inventories of DP and computer equipment. A physical inspection is needed to supplement paper inventories.

The inventory should include all hardware, software (both purchased and developed in-house) and communications equipment. Determine

what equipment is in use, the order and what equipment purchase commitments have been made. Inventory existing maintenance agreements and service contracts. Determine what software development for the equipment is current, being done in-house or under contract.

Following the inventory and its analysis, one will be in a position to determine the extent of the problem and to consider possible alternative solutions along with their costs, including equipment, conversion, deviations and training. The impact of alternative options upon official personnel must also be considered.

and equipment.

Only after the inventory and analysis and the estimation of future requirements are completed can one begin to develop a rational, coordinated plan for equipment purchases. This plan must be developed in concert with all those affected in order to achieve a consensus in the best interest of the company.

In developing a long-range plan, awareness of existing and future standards for microcomputer hardware, software, communications equipment and media is crucial. The more the microcomputers used in the company adhere to the same standards, the lower the support, training and documentation costs will be. Compatibility and data exchange costs will be minimized. Less duplication of effort will occur. Accountability and traceability of results will improve. Expenses attributable to microcomputers will come under better control.

Some standards and compatibility literacy are to address are:

plication programs throughout the company, especially where they produce reports or data used by several groups.

- Use of common interchange media — diskettes, cassette, magnetic tape.
- Use of a limited number of microcomputer brands and configurations.
- Specification of national and international standards as well as de facto standards where applicable.

While it may seem that the selection of a single microcomputer model and configuration, along with a single choice of software, would be the best solution, it is doubtful that such a solution will be satisfactory in any large business or over an extended period of time. No single product yet satisfies all the divergent needs of a large company. The goal is to minimize the number of different systems within the company while allowing for future growth and to satisfy all of the real needs of the different groups within the company.

Problems during planning

During the planning process, one will be faced with several problems in addition to the normal resistance to change. Some are:

- A relative lack of national or international standards for microcomputers, though several de facto standards exist and proposed standards are beginning to be considered.
- Single-vendor solutions have much to offer and may be the easiest way out of a difficult situation, but may not offer the optimum solution.
- The cheapest solution using the currently lowest price equipment without considering compatibility and growth issues may provide the least expensive short-term solution, but is often the most expensive in the long term.
- The not-invented-here syndrome is sure to be a major factor to overcome when dealing with people or groups who have developed their own personal micro solutions in the past and are reluctant to change.
- Ignorance and lack of computer literacy are still major problems. The development of a consensus plan within a large organization requires the education of those affected as well as persuasion.

Consider long-term requirements

During the planning process, it is most important to consider both long-term and short-term requirements and solutions.

Once the plan is formulated and accepted, it will be necessary to begin implementing it and to develop the operational procedures to ensure adherence to it in the future as well as to provide a method for future review, evaluation and modification of the plan.

The solution to today's incompatibility problems lies in the development and implementation of a long-range consensus plan resulting in reduced costs and higher efficiency and productivity.

Eggle is a senior partner at The Research Corporation in Boston, a management consulting firm specializing in high technology.



- Purchase of integrated systems.
- Use of common communications standards, protocols, local-area networks and interfaces.
- Use of common operating systems, languages, utilities, graphics and spreadsheet programs.
- Use of the same specialized ap-

Integrated link with windowing, flexibility

By Barry Lohman
Special to CWI

The proliferation of desktop microcomputers in the modern business environment presents problems for the personal computer user as well as for the data processing department. Assuming that the corporation does not try to has micro altogether, an efficient means of communicating between the two hardware environments is essential.

Since micro and mainframes evolved at different times for vastly different purposes, they were not designed to talk to each other. This lack of communications means frustration for the personal computer user. The mainframe holds a reservoir of data that is difficult for the personal computer user to access, and the personal computer user is at the mercy of backlogs in the DP department.

DP, on the other hand, is frustrated by increasing requests for the same data from any number of personal computer users. Data security is difficult to maintain under these conditions because there is no centralized control of the information.

Be wary of links

Software suppliers have jumped into the fray with a variety of products designed to solve these problems. However, the buyer of a micro-mainframe link should, as always, beware. Many such links cause as many problems as they solve.

The situation is not unlike the communication difficulties faced by two people who speak different languages. Aside from a lot of nonspecific gesticulating, there is little hope that the two will ever be able to understand each other.

Most micro-mainframe links function in a fashion analogous to a human interpreter. The interpreter listens to speaker A and then translates the information to speaker B. Not only is there a strong possibility that there will be something lost in the translation, but there are also built-in security problems. If the conversation is of a confidential nature, neither speaker will be able to speak freely unless the interpreter has complete security clearance.

The interpreter scenario resembles what happens with a nonintegrated micro-mainframe link. More importantly, nonintegrated links typically involve the creation of some sort of intermediate extract file. This extra file, which must later be moved from one environment to the other, presents a potential for the kinds of security

problems associated with extra files.

Multiply this problem by the number of personal computer users, and very quickly there will be multiple versions of the truth. The result has often been the presentation of conflicting reports to management, supposedly

based on the same data.

An integrated micro-mainframe link allows all personal computer users to communicate directly and interactively with the mainframe; data and information can be accessed and manipulated in real-time. Thus, each personal computer user is as-

sured that he is using current information.

With an integrated solution, there is only one set of access strategies to access any file structure without any other system activity. And since a redundant copy of a data file is not created, the security of corporate

files remains the same as with standard applications.

Data manipulation standards for a micro-mainframe link should be the same as with all applications, utilizing the same access verbs as the mainframe's applications.

Again, the analogy to hu-

We wrote the
book on portability.
In nine
different languages.

	FORTRAN/2 CPL MPL/II	FORTRAN/III CPL-88 Conquest CMT	FORTRAN/III TSD PC DOS	FORTRAN/III MEDICE	MC-68000 CPL-88
FORTRAN-77					YES
C-BASIC/CompuLink					YES
TransMIT					YES
Level II COBOL					YES
PL/I					YES
C					YES
Assemblers Plus Tools					YES
Access Manager					YES
Display Manager					YES
Access/SP					YES
COBOL/Access					YES
Personal BASIC					YES
Di. Logo			YES		



urged for micro-mainframe communications

man communication is instructive. The differences between English and Spanish, for example, are not limited to vocabulary. The two languages use vastly different grammars and syntaxes, just as mainframes and micros typically use different syntaxes for commands.

Ideally, micro-mainframe link software should make a personal computer operate as a terminal attached directly to the mainframe host.

A good micro-mainframe format data on a personal link should allow the user to computer into formats that

are acceptable to decision support software products — word processing, spreadsheets, graphics and so on. The link should allow the user to select the way he wants to go and should format it automatically.

Some micro-mainframe links will only access certain

kinds of mainframe data, such as the data base management system. Look for a link that will allow access to any data residing on the mainframe while maintaining standard security guidelines.

Similarly, the link should be able to perform the reverse, allowing access to any data residing on a personal computer.

Ideally, micro-mainframe link software should make a personal computer operate as a terminal attached directly to the mainframe host. While the application being used is actually operating on the mainframe, with this type of link, it appears to be running on the personal computer, which emulates a terminal.

Windowing capabilities

The micro-mainframe software solution should provide windowing — the ability to show multiple screens simultaneously, enabling the user to perform functions that will search the personal computer file structure. Windowing, similar to working at a desk, allows the user to, in effect, look up a telephone number, Zip Code or other references from the computer's files while the user is working on something else.

Another important feature is flexibility in terms of connection modes. If the data processing architecture involves more than one hardware vendor or if different communications modes are used, the micro-mainframe link should be flexible enough to allow such methods as asynchronous communications links, coaxial cable adapters or IBM's Systems Network Architecture/Synchronous Data Link Control.

Finally, the vendor should not only support the micro-mainframe link, but also provide the opportunity to add integrated products as needs expand. A vendor that can offer a data base management system, application development tools, network management, communications, fourth-generation problem solving and more will allow users to make the most of the micro-mainframe link.

Flexibility is really the name of the game here. A micro-mainframe link should provide all authorized users the ability to access the data they need and at the same time keep corporate data files secure from unauthorized use.

In this way, communications is maximized, and everyone is utilizing the same version of the truth.

Lotman is product manager of microcomputer software at Cincom Systems, Inc. of Cincinnati.

To every software developer who'd written off portability as an impossible dream, Digital Research humbly announces a few monumental breakthroughs.

We not only offer languages that are portable from 8 to 16 to the 32-bit chips of the future, they're portable across all popular operating systems, too. What's more, we supply the broadest range of quality languages and development tools available today. And will tomorrow.

So rest assured. Whether you design applications at a major corporation, plan to become a major corporation or just qualify as a hobbyist, you only have to write it once.

Simply pick the Digital Research language that's right for you. From Personal BASIC™ to Digital Research FORTRAN-77.™ The newest member of our remarkable family.

To complement languages, we offer a complete workshop of development tools. Our Display Manager™ and Access Manager™ simplify the design of screen displays and data bases. So you spend less time and effort.

If you write in COBOL, our Animator™ source level debugger will get your software running in record time.

And for programmers skilled with IBM mainframe SPF, we offer micro/SPF.™ An editor that helps turn your invaluable experience into valuable new software applications.

At Digital Research, we work as hard for you after the sale as we do to get the sale. With backup like quality documentation, software updates and a phone line to our technical support team.

With so much productivity and service to draw on, it's small wonder IBM chose our languages for its IBM® PC, XT and the new IBM 3270/PC.

For more information, call your IBM representative.

Or, for the Digital Research retailer nearest you, call 800-227-1617, ext. 400. In California, 800-772-3548, ext. 400.



**DIGITAL
RESEARCH**

©1984 Digital Research Corporation. All rights reserved. Digital Research is a registered trademark of Digital Research Corporation. IBM, PC, XT, and 3270 are trademarks of International Business Machines Corporation.

Micro-to-mainframe:

Before you settle for a simplistic solution, ask a few serious questions.

Choosing a micro-to-mainframe communications system is no game.

So before you toy around with "easy" solutions, ask some serious questions.

Will this product support full IBM Terminal Emulation?

Make sure the system can emulate remote batch and interactive IBM terminal systems.

Does the company offer a variety of products?

You should have your choice of stand-alone front-end processors, IBM PC or XT boards, or an OEM board. All ready to run on the most popular operating systems.

Can I get fast answers to my questions?

Insist on toll-free access to qualified service personnel before and after the sale.

What if I need a quick analysis of a problem?

Ask if the manufacturer has a Communications Test Center for product testing over public phone lines. And find out if the system has internal diagnostics.



Suppose something goes wrong with the unit?

The company should offer a 30 day money-back guarantee and a 12 month warranty that includes a free replacement unit.

What about future product development?

Make sure the products you're going to need soon will be available soon.

Who am I dealing with anyway?

How long have they been in business? The longer, the better.

How much is all this going to cost?

Here's a point of reference: Our own DataTalker product line will give you all the capabilities and services just described for as little as \$695. Complete, if you'd like to know more, contact our Marketing Support Group at 1-800-321-7785.



Providing Data Communications Solutions

Winterhalter, Incorporated
3853 Research Park Drive
P.O. Box 2180, Ann Arbor, MI 48106
313/662-2002 800-321-7785
TWX 810-223-2423
TELEX 234-216



See us at
COMDEX™/Spring '84

May 22-25, 1984
Georgia World Congress Center,
Atlanta, Atlanta, Met.
Atlanta-Mechanics Met.
Atlanta, Georgia

DataTalker™

By Winterhalter, Incorporated

Winterhalter, Incorporated has been providing data communications solutions to major manufacturers of microcomputers and word processors since 1978. Our DataTalker front-end processors and PC boards are used by companies around the world, from start-up manufacturers to the Fortune 1000.

Bank uses micro net for overseas audits

NEW YORK — A worldwide banking operation can produce worldwide headlines. Inspecting Citicorp's facilities without links to the home computer system here and sometimes without any computing power at all showed auditors for the company's International Inspection Division (IID) just how hard life on the road can be.

Partly as a result of the experiences of its foreign auditors, a worldwide network of personal computers called Auditnet has become an integral part of Citicorp's international auditing activities.

The network was created to expand the data base access and communications capabilities of IID, which is responsible for auditing Citicorp's overseas institutional banking and capital markets activities to more than 90 countries. The department has more than 200 auditors assigned to offices in 32 countries, according to Donald E. Ehwert, a Citicorp vice-president and IID's deputy department head.

Ehwert explained that the department's auditors have had access to transaction data and accounting records stored in Citicorp's mainframe computer systems since the overseas branch operations were automated over a decade ago. The problem, however, was that the auditors often lacked immediate access to the mainframe computers and their data; this was especially true when the auditors were on the road in outlying countries.

Processing periodic reports

Another problem was the processing of periodic reports from the field. On a quarterly basis, each field location typed a summary report of its activities and mailed it to the regional office for consolidation with reports from other field locations in the region.

The regional summaries were mailed to headquarters here to be consolidated and retyped into one worldwide summary. This process produced redundant typing work and delays in the completion of reports.

The solution to these data access and communications concerns crystallized in 1983, one year after the introduction of the IBM Personal Computer, around which Ehwert had structured Auditnet.

Now almost completely implemented, this network consists of at least one IBM Personal Computer and one portable IBM Personal Computer-compatible computer in each of IID's 32 overseas offices. The network is structured around three criteria: it is based on the IBM Personal Computer and application software written for that machine; the Personal Computer and the compatible portable must provide an interface to Citicorp's telecommunications network; and the Auditnet personal computers must allow for terminal emulation that provides access to Citicorp's overseas mainframe computer systems.

To provide his world-traveling auditors with portable computing power that meets those criteria, Ehwert selected the portable computer manufactured by Compaq Computer Corp. of Houston.

The Compaq is a 28-1b, full-function

portable personal computer.

"The Compaq provides Auditnet capabilities to auditors who are on the road or based in countries where Personal Computers are difficult to get," Ehwert said. Presently, there are 80 IBM Personal Computers and 26 Compaqs spread throughout IID's territory. Ehwert added, "The principal purpose of Auditnet is to provide intelligent-terminal-to-mainframe access. But it also provides stand-alone processors for uploading and downloading files to and from mainframes."

As intelligent-terminal-to-main-

frame access tools and stand-alone audit processors, the Personal Computers and Compaqs are used to retrieve data stored in mainframe files for auditing and analysis, to develop and run specific auditing software and to apply real-time auditing techniques.

As channels in a communications network, all Auditnet computers are linked to Citicorp's Global Telecommunications Network (GTN), a private network of leased lines.

"With this network, our international auditors and I can chat interactively. We can be on-line with each other, and here is where the portable

computers are extremely important. If one of our auditors is on the road ... he can hook up the portable and a modem, dial into the closest Citicorp GTN node and proceed to send [a] file either directly to my GTN address or to my electronic mailbox."

An electronic library tools, the Auditnet computers maintain the auditor's working papers and run standard vendor software programs. They also provide electronic access to a large library of IID's own auditing procedures and guidelines, which help Citicorp analyze the key risks and controls associated with international banking activities.



World's Fastest Serial Printer

Line printer performance at half the cost

**Up to 300 lpm throughput
at 600 cps**

**Letter Quality/
Correspondence at
100/150 cps**

High Density Graphics

**Lowest cost per
character**

NCR

NCR is a Registered Service Mark

Florida Data Printers give you line printer throughput at well under line printer prices. They match line printer performance on many types of jobs. Throughput is optimized by Florida Data's patented skewed energy printhead — the world's fastest.

The reliable automatic cut sheet feeder is an integral part of the printer — not an expensive add-on. The unique triple paper path also allows continuous forms and hand fed sheets. These printers are built to run 365 days a year. And nationwide NCR service is part of the package.

**Call (305) 259-4700 or
mail coupon for details**

Florida Data Corporation
6000 John Rodes Blvd.,
Melbourne, FL 32935

Send me information on your
NCR printers.

NAME	_____
TITLE	_____
COMPANY	_____
ADDRESS	_____
CITY/STATE/ZIP	_____
TELEPHONE	_____

Save up to 50% off the Manufacturer's Suggested Retail Price
COMPAQ / Spring '84

May 22-25, 1984
Atlanta-Fulton County Convention Center
Atlanta, Georgia

**FLORIDA
DATA**

Is 1984 the year for multiuser micro systems?

Market forces, technical advances seen spearheading revolution

By Shamus Arshay
Contributor to CWS

The year ahead will see the next step taken in the microcomputer revolution in business — an evolution from single-user IBM Personal Computer-compatible computers to systems designed for multiple users. Market forces and technological advances should drive the industry in that direction.

Microcomputers in large businesses have changed the face of corporate computing. It is difficult to deny the benefits of single-user personal mi-

crocomputers — the most important being the dramatic increases in personal productivity that micro have provided. To a certain extent, personal computers have alleviated pressure and demand on corporate management information systems departments and host computers.

However, there are also negative influences resulting from the presence of personal computers in large businesses. MIS departments now have an opportunity to correct and control these with multiuser microcomputers.

One of the primary negative factors associated with personal computers is that individuals in business are often not more work teams. Personal computers may be very effective in increasing individual productivity, but their cost and inherent nature can be detrimental to team productivity and effectiveness.

While personal computers are relatively inexpensive, multiple system purchases at an average of \$4,000 to \$7,000 per user for hardware and software can add up quickly. In addi-

tion, purchasing multiple single-user systems does not guarantee total compatibility. The significant additional cost of linking systems for more effective communications and sharing of resources among users must also be considered. So, too, must be the expense of linking individual microcomputers to host computers.

A second serious concern, especially for MIS managers, is the lack of data security. In virtually every large company in this country, a host of personal computers sit on desks. Often, vital and sensitive corporate information is included in boxes of diskettes sitting next to them or on the computer's fixed disks — accessible to unauthorized individuals. Even more serious, this vital corporate information is being used without regard to the kind of backup or system maintenance precautions that are second nature to MIS departments.

Multiuser micro systems

Multiuser microcomputer systems offer nearly all of the benefits of personal computing. And they provide solutions to problems caused by the proliferation of single-user systems in corporations.

Multiuser systems are simply a logical extension of single-user microcomputers. The primary difference is the sharing of resources such as fixed disk storage, printers, power supply and application software. Depending on the system, as few as two or as many as a dozen people can be connected to a multiuser system.

In addition to sharing resources, however, users can also share the information and data they need in a typical business situation. For example, several individuals may be involved in the research and writing necessary to prepare a major report. Instead of printing out work on paper and reentering changes made to the paper copy, a multiuser system would allow the transfer of information between users. Multiuser systems are an extension of how people normally work together, and they bring productivity to the entire team instead of just to individuals.

Multiuser systems also provide economies when systems must be linked or when users need access to information on host computers. A multiuser system requires only one 3270 connection to a host, despite the number of users. Multiuser systems can also serve as nodes of a more expensive local-area network linking departments within a company — minimizing the number of network connections needed.

In terms of security, the centralized server setup of a multiuser system gives an MIS department influence over the care and maintenance of these systems. An MIS department can make a good case that system installation, tape backup and recovery, software installation and update and

See MULTITASKER SR/12



Go beyond equipment compatibility.
Reach for total performance.

The Zenith Z-100 PC's.

In the brutal rhythm of the time trial, something clicks: cyclist and cycle blur into one, and sprint toward total performance. And, in your office, you'll experience that same kind of oneness with our new IBM-compatible Zenith PC's.

Their enhanced features actually take you beyond IBM compatibility. Like internal expandability that allows you to add peripherals without adding size. Storage that can expand up to 11 megabytes. The ability to run virtually all software designed for the IBM PC. And a detached keyboard with a "smarter" key layout for added convenience.

Reach for total performance with the desktop and portable Z-100 PC's: call 1-800-842-9000, ext. 1, for the name of your nearest Zenith dealer.



The Z-150 PC



The portable Z-100 PC

For the Zenith Data Systems Dealer nearest you call

1-800-842-9000 Ext. 1.

© Zenith Data Systems

ZENITH data systems
THE QUALITY GOES IN BEFORE THE NAME GOES ON

Arshay is senior vice-president of marketing and sales for North Star Computers, Inc., a San Leandro, Calif.-based manufacturer of multiuser microcomputer systems.

UNION
BASF Texture traps the
moisture on the surface and
keeps it from evaporating.

UNION
BASF
Texture

UNION
BASF

SPECIAL REPORT

Service options for micros: Choosing the

By Gary Suttner
Special to CWT

You agonized over their purchase decision: What brand of microcomputer? How many? You led the users by the hand through the initial training process. Now some of them are back at your door, saying the machines have broken down. Now what do you say?

Over the past few years, personal computers found wide acceptance in both large and small organizations. The machines have been used in a great variety of stand-alone functions and as part of data processing and data transfer systems.

This acceptance has raised a number of issues regarding the maintenance and repair of personal computer hardware. Although personal computers offer a high degree of reliability, breakdowns of varying severity occur from time to time. Organizations with a large number of personal computers need to formulate and implement service strategies.

Because DP managers have always had to concern themselves with service for data processing and communications equipment, they generally are experienced in purchasing equipment service and tend to contract for it in advance.

Non-DP personnel

However, there is a growing number of non-DP personnel who have responsibility for personal computers. They generally may not have developed experience in buying maintenance service.

In fact, since personal computers in many organizations are used independently of a central DP group, even many DP managers have not tended to think through the service issues involving personal computers.

Service options available today generally take one of the following forms: on-site service, depot service (that is, at a service facility) or depot service with a loaner computer provided for the duration of the repair. These options generally can be contracted for in advance or delivered on a per-incident basis.

Which option is best is determined for the most part by the type and level of user need.

Critical need situations are those in which it is extremely important that the machines operate without interruption. As an example of critical need is a customer interface situation in which an order must be taken or information provided via the computer immediately.

A second example of critical need involves personnel

computers used for continuous, essential data entry and retrieval, such as production control systems or interactive inventory/order functions.

In these situations, a contract for on-site service may be the best option. On-site service is considered to be

Service options available today generally take one of [three] forms. Which option is best is determined by the type and level of user need.

the fastest way to repair a machine. Service organiza-

tions tend to prioritize service calls; the assumption

can be made that service contracted for in advance generally reflects the customer's service needs. A contract thus ensures the speediest response.

In either case, however, on-site service is the most costly form of service, since a technician must be dis-

HAVE YOU BEEN BLIND COMPUTER WITH THE



NEC's Advanced Personal Computer offers the sharpest color graphics of any personal computer.

Graphics are being used more and more by businesses every day. They give companies a clearer picture of their place in the market. They make for more effective presentations. And with slides and color trans-

parencies, they can let a room full of people see the same thing at once. Although most people see the value of graphics, very few are aware of the personal computer that lets them create the best color graphics.

It's the Advanced Personal Computer from NEC.

This slide was produced from the screen using Videograph™ software, an inexpensive screen shooter, and Polychrome™ 3D on film in less than 5 minutes. For less than \$1,000

NEC's Advanced Personal Computer offers the widest range of quality graphics.

One reason the APC is better is that it lets you do more kinds of graphics than any other personal computer.

In fact, it gives you the kind of graphics you'd expect only from a much more expensive computer.

With the APC, you can produce color transparencies, color slides, or output to a variety of printers and plotters. You can even do Computer Aided Design (CAD).

Our screen is graphically better.

Seeing is believing. And one look at our color screen will prove it's the best.

But it's no accident. It starts with the NEC 7220 graphics processor, the most advanced graphic chip available.

Then, unlike other PC's, the



Center MSA is a trademark of Control Management Systems, Inc. Videograph is a trademark of Imaging Communications, Inc. Polychrome is a trademark of Chrom Labs, Inc.

plan, vendor that best answer user needs

patched to the customer location.

A noncritical need for a personal computer might be defined as a situation in which a user can do without the machine for a day or more. In this case, different service options may be appropriate.

An example of noncritical need would be if the user requires a personal computer to perform only one part of a particular task and can turn to other aspects of the

Since personal computers in many organizations are used independently of a central DP group, many DP managers have not tended to think through the [microcomputer] service issues.

task while the machine is repaired or, perhaps, substitute another way to perform the task. For instance, a re-

search analyst who uses a personal computer to tabulate information can turn temporarily to a calculator and graph paper.

Another example of noncritical need is a system configuration in which a number of personal computers are used as clerical data entry and retrieval terminals. If the machine goes down, users may be able to keep along with the remaining units until it is fixed.

In these instances of noncritical need, one of two service options may be most suitable, depending on particular circumstances.

Depot service, or repair at a central service facility, is the least expensive form of service. It generally offers a turnaround time of three to four days (excluding shipping time) and can be contracted for in advance or performed on a per-incident basis.

Depot service with a loaner computer for the duration of the repair represents a middle ground, both in availability of computing power and in cost of service. Under this option, the user normally has a working machine the next day. This can also be contracted for in advance or performed on a per-incident basis; however, if the need is great enough to warrant a loaner computer, a service contract should be considered as the most sensible approach.

Where to get service

Another issue to be considered is where to get service.

The most obvious choice is the manufacturer or distributor of the equipment — most people tend to go back to where they bought it.

Many people have a perception that manufacturers or distributors offer high-quality service to satisfy customers and therefore keep them. While that is generally correct, there are a number of instances in which a manufacturer or a distributor focuses resources on equipment sales rather than on service.

Users must take into account the reputation of the equipment vendor, its past performance, its local presence and many other factors in determining whether its service offering will be adequate.

Regardless, one limitation to manufacturer service is that manufacturers general-

See SERVICE SR/12

TO THE PERSONAL BEST COLOR GRAPHICS?



Contest M8A runs in high resolution color on the APC. But it can only run in one color on the color monitor of the leading brand.

APC graphics option has its own dedicated memory, so there's never a tradeoff between color and resolution.

Software will make you a big-time producer.

Better hardware alone isn't enough. You also need better software. And NEC provides that, too.

Take Graphplan® for example. Graphplan can take spreadsheet format data and produce customized business graphics on paper. Instantly.

Graphwriter® will let you produce professional color drawings in

over 20 different formats. Then turn them into transparencies or hard copies using the most popular pen plotters.

Videograph® makes creating free-form color images for slide presentations easy and inexpensive.

Autocad® lets architects, engineers and designers create sophisticated graphics and designs, then produce precise drawings with popular plotters.

This software combined with the APC hardware will give you the best graphics you can get on any personal computer.

For the complete picture, call NEC.

For product literature on any of NEC's APC graphics capabilities, call 1-800-343-4419.

Designers can use Autocad® to make the design process faster and easier.

In Massachusetts, call 1-617-284-8635.

And find out why more and more graphics users with vision are saying "NEC and me."

NEC AND ME

NEC Information Service, Inc.
1414 Mass. Ave.
Boston, MA 02119



You can produce vivid subjects like these with the APC.

Screen Shooter is a trademark of NEC. Videograph is a trademark of Pitagora. Graphplan is a trademark of Graphplan. Autocad is a trademark of Autodesk, Inc.

SPECIAL REPORT

MULTIUSER

from 88/8

communications across should be considered part of its responsibility.

There are several alternative architectural approaches to multiuser microcomputer systems. The more traditional approach is a system that shares not only fixed disk and peripherals, but the central processing unit as well. This time-shared approach has a major disadvantage — as users are added to the system, each user gets a proportionally smaller share of CPU time.

Multiprocessor, multiuser systems are becoming more popular because of their better response times. The multiprocessor approach provides a separate workstation CPU for each user and a server processor to control the shared functions of the system.

A third alternative is to link individual personal computers via a local-area network. While this offers the advantage of local storage and processing power, local-area networks can be significantly more expensive than the other two approaches and have some inherent performance limitations.

In addition to architecture, there is a second important consideration in purchasing multiuser systems. This relates to compatibility between the wealth of single-user applications software purchased by microcomputer owners in large businesses and the software for multiuser systems. The emergence of a software and hardware standard based on the IBM Personal Computer and Personal Computers XT microcomputers will facilitate the evolution from single-

user systems to multiuser systems.

With IBM Personal Computer compatibility, a large business' significant investment in microcomputer applications software can be protected. In addition, the viability of the system is ensured since the large potential user base of IBM Personal Computer-compatible systems provides software and hardware vendors with an economic incentive to continue to release new products for those systems.

Market forces and technological advances in 1984 will drive an evolution from single-user micros to systems designed for multiple users. For MIS and DP departments in large corporations, this trend represents an alternative to negative aspects of the proliferation of single-user microcomputer systems in business.

SERVICE

from 88/11

ly are not willing to service equipment from other manufacturers. There are exceptions, of course, but even distributors tend to service only the equipment that they sell. That may be a real problem.

Today's offices contain a variety of office equipment, much of which is electronic, ranging from private branch exchanges to microcomputers and associated peripheral equipment. Personal computers are being used increasingly as integral parts of data communications networks, which typically are composed of many types of equipment from a number of manufacturers.

In these instances, when a malfunction occurs it may not be readily apparent whether the personal computer or another part of the system — such as a modem — is at fault.

A related problem is that a number of different service organizations may need to be used. At the very least, this can be cumbersome; at most, repair can be delayed as the responsibility for the ultimate problem is shifted back and forth among service organizations.

A way out of this dilemma is to use an independent second- or third-party service organization with wide-ranging capabilities.

Second-party service

Second-party service occurs when a manufacturer or distributor officially authorizes or contracts with an outside service organization to fulfill equipment warranty obligations and to perform nonwarranty service on its equipment as required.

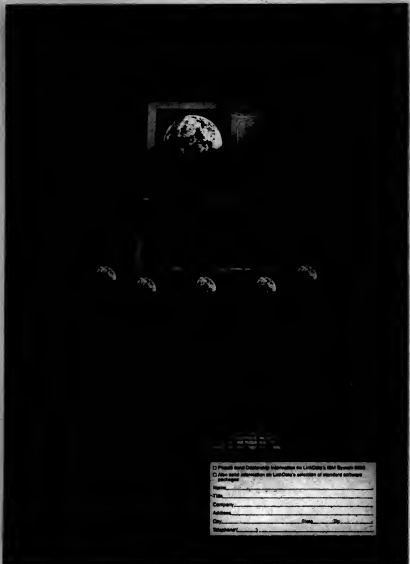
Third-party service is service provided by a service organization independent of the manufacturer or distributor. Most independent service organizations provide service on a wide range of products from different manufacturers.

Generally speaking, the cost of service as provided by second- and third-party organizations is less than that from manufacturers or distributors.

Because of widespread personal computer use, both large and small user organizations should formulate and implement programs for personal computer service.

The character of service required should be determined by the criticality of user need. For critical needs, on-site service delivered under a prearranged service contract provides the strongest assurance of rapid, dependable service.

The choice of a service vendor is an important one. The obvious choice is the equipment manufacturer or distributor, but in today's increasingly integrated and complicated office environments, an independent organization with wide-ranging service capabilities may, in fact, be the best choice.



☐ Please send Outstanding Information on LISTSERV & Other Service.

☐ Also send information on ListCity's selection of independent software packages.

Name: _____

Title: _____

Company: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: () _____



**Announcing the birth of the *Personal Information Center*—
a new concept in intelligent data access for your company's end users.
And you're invited to a **FREE**, half-day Seminar
to learn all about this innovative first from Informatics.**

At this free Seminar you'll see how the *Personal Information Center* can help you:

- Manage and control the confusing proliferation of hardware and software in your Information Center
- Integrate your Information Center with today's mainstream DP and IBM® Personal Computer tools.

But that's only the beginning. At the Seminar there will be a lively discussion of such vital Information Center issues as...

- Selecting appropriate hardware and software for your users' needs.
- Offering immediate versus deferred processing.
- Using production data bases or duplicating files.
- Balancing unlimited data access with system security concerns.

The Seminar will also address the entire issue of the micro-mainframe connection, and many more topics of immediate interest to data professionals like you.

Plus, we will introduce Informatics up-to-the-minute solutions to your Information Center needs, including reporting and inquiry systems and micro-mainframe integration tools.

The *Free Personal Information Center Seminar* is being offered in or near your city. But attendance is limited. So, mail the coupon or call toll free today to reserve your place at this valuable *Free Seminar*.

Pre-registered for the *Free Personal Information Center Seminar* and get a free bonus. We'll send you a reprint of the *Computerworld* article, "The Micro/Mainframe Link," by Merrill Lutz.

Mail this coupon or call toll free...
1 800 227-3800 Ext. 911

In Canada, call 1-800-387-7128

Informatics

THE SOFTWARE ENGINEERS

YES. I'd like to learn more about the *Personal Information Center* and how it fits my company. I'm interested in... ☐ **Micro/Mainframe Link**, by Merrill Lutz.

☐ Please schedule for the following three dates (no exceptions):

<input type="checkbox"/> Atlanta	April 24	<input type="checkbox"/> Detroit	May 3	<input type="checkbox"/> New York	May 3
<input type="checkbox"/> Dallas	May 4	<input type="checkbox"/> Houston	April 27	<input type="checkbox"/> Philadelphia	May 1
<input type="checkbox"/> Chicago	April 27	<input type="checkbox"/> San Diego	April 24	<input type="checkbox"/> Tampa	May 2
<input type="checkbox"/> Dallas	April 28	<input type="checkbox"/> Denver	May 2	<input type="checkbox"/> Washington, D.C.	May 2

☐ I cannot attend a seminar. But please send me more literature on the *Personal Information Center*.

Name _____ Title _____

Company Name _____ Phone Number _____

Address _____

City _____ State _____ Zip _____

Mail this coupon to: Informatics, 10000 Wilshire Blvd., Suite 1000, Beverly Hills, CA 90210. Or call 1-800-227-3800 Ext. 911.





Micro bloopers: A few infamous foibles

By Russ Henderson
Special to CWS

The funny little man with the bowler hat and Charlie Chaplin moustache makes it look so easy. The funny little man is in for quite an education.

New users approach the computer with enthusiasm,

curiosity and a certain sixth sense for confounding the experts.

Like the person in Denver who put two diskettes in the same drive because the instructions called for a double-density disk.

Or the person in Atlanta who took scissors and cut out

the circular disk from inside the disk jacket, then put it into the drive because there was no way that disk could spin around if it was inside that black disk jacket.

Other people have other problems with personal computers.

■ Getting caught up in the

Christmas syndrome. People just go out and buy a computer, then they try to figure out what to do with it.

■ Don't read the instructions. Just start typing until the system bombs. Even professionals love to do this.

■ Connecting or disconnecting devices and cards

without turning off the power. Who cares if the boards get fried?

■ Getting lost within the program, turning the power switch off then on rapidly without waiting 10 seconds for a reset, then wondering why the cursor just keeps blinking.

■ Attaching any old printer to the system, then wondering why no one can make it work or why it prints funny characters and beats itself to death.

■ Buying the most expensive spreadsheet program, then trying to use only 64K bytes of memory to make it work. Or spending hours to develop a work sheet that won't fit into 512K bytes.

■ Adding extra memory or changing monitors, then forgetting to change the DIP switches on the motherboard.

■ Spending hours to build a work sheet, only to discover that there are no formatted disks available to save it.

■ Buying expensive but powerful data base or language packages, only to find out they are not menu-driven and require hours of training before they can be used.

■ Failing to write down any reasonable form of documentation.

■ Attempting to make backup copies of disks (this always happens late in the afternoon) by putting the original disk in the B drive and the backup copy in the A drive by mistake and then destroying the only copy in existence. This can make grown men cry.

■ Trying to save money by buying bargain disks.

■ Wondering why you just can't take an IBM disk and stick it into an Apple Computer, Inc.'s Apple and expect the Apple to read the disk.

■ Backup, what's backup? Aren't hard disks designed to be turned on and practically run forever? ... No. It is positively amazing how many people do absolutely no backup and then wonder why their files are gone forever into the black hole.

■ Creating a word processing document (say, 10 pages you personally labored over for hours), then trying to save it, only to have the system tell you there is no room left on the disk to save it, then drop you straight out of the program.

■ Thinking you can put together a simple network of personal computers in a matter of a day or two.

■ Thinking there are no mistakes in the manual.
Henderson is president of Personal Computer Management Association, a training company based in Orange, Calif.

HIGH PERFORMANCE LONG DISTANCE RACER



You can't win a race when you're not on the road. That's why you need a printer that does more than run fast. You need one that runs long. You need a Datasouth.

MORE CHARACTER

The printhead on a Datasouth printer is rated to live through 500 million characters. Even in the most demanding applications, this means years of service without an overhaul.

HEAVY DUTY CYCLE

For a Datasouth printer, "100% duty cycle" is something of an understatement. So far, over 35,000 Datasouth printers have hit the hard copy road, and so few have pulled into the garage for repairs, it's hard to say how close to forever any of them will last.

MORE THAN THE HUM OF ITS PARTS

There's less to go wrong with a Datasouth printer. With sophisticated microprocessor control and unusually

efficient design, Datasouth printers have few moving parts. They also don't need add-on "personality boards" to accommodate different computers.

TAKE YOUR CHOICE

Datasouth reliability comes in two high performance models. The D5180 is a legendary workhorse that delivers crisp data quality printing at 180 CPS. The new multimode D5220 cruses at 220 CPS for high speed data printing and at 40 CPS for letter-quality word processing. Both models print precision dot-addressable graphics.

If you have a high performance printing need, Datasouth has a high performance printer to fit it.

DRIVE ONE TO WORK.

Test drive a Datasouth printer at your nearest show-room today. Then put it to work. With a Datasouth racing beside you, there's no way to lose.

south

Find Datasouth Printers At
Participating *Sharpshooters* Stores
And Other Fine Dealers.

Datasouth Computer Corporation
Box 240947 Charlotte, NC 28224
704/523-8500 • Telex 6843018 DASOU UNW

Firm tags DPer to ride herd over micros

RICHARDSON, Texas — When a data processing systems development manager was tagged to ride herd over about 200 microcomputers in use at a Rockwell International Corp. plant here, he picked a machine that was relatively cost-free to help him keep track of things.

The Collins Transmissions Systems Division near Dallas is part of Rockwell's Commercial Electronics Operations. The Collins Transmissions Systems Division, which makes microwave systems, currently numbers about 4,000 employees. Although various limited-capability desktop computers have been around the division for five or six years, interest in more powerful machines picked up in late 1982. Several executives acquired Apple Computer, Inc. Apple IIIs, and about 60 IBM Personal Computers were purchased for engineering administration and computation.

With a growing number of microcomputers appearing in the Collins Transmissions Systems Division, it was decided that the Information Systems Department would help support them. Systems Development Manager Rick Wohleber was put in charge of the project and now has two full-time staff members supporting approximately 200 micros in the division.

Rockwell's Information Systems Department does not push the use of

personal computers. It does, however, offer extensive support to those who desire it. The department's involvement starts before a new computer arrives, since all purchase requests are routed through the department for review. Wohleber noted that "although we don't have the authority to say no, we do suggest more appropriate alternatives when necessary."

Nor does the Information Systems Department push any certain brands. "We feel it's our responsibility to provide the most appropriate computer to meet the individual's re-

quirements," Wohleber said, "so we make a very strong effort to maintain objectivity about our recommendations."

Once the purchase order goes through, the Information Systems Department frequently helps install the new machine and gives training as needed. After installation and startup, the department is available to assist the user with problems. The Information Systems Department also maintains a software reference library where micro owners can try out various programs before purchasing them.

Wohleber summed up his department's approach by saying, "We feel that personal computers are exactly what the name says: a computer to be used by an individual. So our support is given on an individual basis."

Among the many micros at the Collins Transmissions Systems Division are about 10 Apple Lisa systems, which are scattered throughout middle and upper management at both the Collins division and Commercial Electronics Operations. Users include a project manager, a division controller, a vice-president of personnel, the financial planning area and two manufacturing managers.

Wohleber has a Lisa on his desk supporting him in his role as an information systems development manager. He uses the Lisa for project control, budget management, presentation, memos and letters.

The machines have been accepted by Rockwell managers, a segment of the corporate world that is often resistant to desktop computers. Indeed, Wohleber said, "Learning file commands, path names and so on can be very frustrating and may result in the computer not being used."

"I felt the Lisas were potentially one of the best productivity tools I'd seen in a while, especially for people who were not computer-oriented. And as a management tool, there are some tremendous advantages. We've

See LISA SR/18

Managing inventory project

RICHARDSON, Texas — Joe Parr, a customer of Rockwell International's Collins Transmission Systems Division's Information Systems Department, is project manager for a large Collins division software project known as Rockwell Inventory Management System (RIMS). Parr got his Apple Computer, Inc. Lisa system in fall 1983.

Like most managers, Parr spends a lot of time writing reports and memos, so the Lisa software he uses most is the word processing program,

Lisawrite. He creates almost all of his own documents, thus reducing the turnaround time on his projects. "I just sit down and do it," Parr said. "I get it out the same day that I write it, and it's exactly the way I want it."

The benefits of this efficiency have been especially noticeable with presentations, the bane of many executives' work days. "Doing presentations used to be an agonizing process," Parr said.

He would begin by writing down
See RIMS SR/18

Learn Lotus® by the book.

Electronic spreadsheets. Graphics. Databases. "What-if" models. Lotus 1-2-3™ really helps run the office, if you know how to run Lotus.

We can help. "Putting 1-2-3 To Work" lets your fingers do the learning, using actual Lotus software. Your place. Your pace.

NTS. It took ten years of hard work to make learning this easy. Write or call today.

Lotus and 1-2-3 are trademarks of Lotus Development Corporation.



Self-Study Course: \$95.

☐ Please send me _____ copies of the "Putting 1-2-3™ To Work" self-study course @ \$95 each + \$3 each for shipping and handling. (California residents add 6-1/2% sales tax.)

☐ My check or money order for \$ _____ is enclosed.

☐ Please charge my credit card:

VISA/MC # _____

Exp. Date _____

Signature _____

Name _____

Title _____ Phone _____

Company _____

Address _____

City _____ State _____ Zip _____

For information, call collect: (213) 394-7685.

(For our New York office, call collect: (212) 869-1730.)

COXA

NTS NATIONAL TRAINING SYSTEMS, INC.

Los Angeles New York London

1111 Broadway, Santa Monica, CA 90401

(213) 394-7685

SPECIAL REPORT

**FARR** from SR/17

what he needed for overhead projection. His secretary would type up the requested pages; Farr would review them; the secretary would make the changes; and he would check the pages again. "We'd go through two or three oscillations like this. Now it's more like two or three hours before the meeting that we start, and the presen-

tation is done immediately, just the way I want it."

After creating the original documents himself (using LisaDraw for pages with headlines only, LisaDraw for flowcharts and LisaGraph for graphs), Farr prints them out on the Lisa's printer, then uses a photocopy machine that turns them into overhead projection calls.

Farr's Lisa applications do not end with reports and pre-

sentations. Because he was comfortable with the project scheduling format he used before he got a computer, Farr has recreated that system with LisaDraw. "Before I got the Lisa, I would literally have to cut and paste a couple hours a week, and then the secretary would have to retype it," Farr said. "Now, I've put away my scissors and my tape and my correction fluid."

Farr has created bar-chart schedules for all aspects of the Elms project. For overviews, there is a high-level document with about 16 major project segments, each containing six subsegments.

Tracking progress

A more detailed file for everyday use contains about 20 near-term task charts with about 15 subtasks on each. By having all this information right at hand on the computer, Farr finds it easy to track the progress of the project and make any necessary changes.

Farr's Lisa also keeps track of his own tasks. "I used to keep a manual 'to do' list. Now I keep it on LisaWrite. I don't have mounds of paper on my desk, and I don't have to wonder which pile of paper a specific note is in. I can just pull it up and look at it quickly, and if I want a copy, I can make one. And, I have a record of what I did each day."

Although Farr is an engineer himself, he appreciates that a technical background is not necessary to use the machine.

"I'm a 'double e,' and I like technology, but I probably only know a thousandth of what this thing can do. But I can walk right up to it, do what I need to do and go on to something else. It's a tremendous time saver," Farr concluded.

LISA from SR/17

even had people request them who had no interest in learning how to use a conventional personal computer," Wohleber said.

According to Wohleber, very little of the Information Systems Department's time is spent supporting Lisa systems. Of the approximately half-dozen types of microcomputers currently used in the Collins Transmissions Systems Division, Wohleber noted, Lisa users "have required the smallest amount of assistance."

The only significant problem Wohleber has encountered with the system is a shortage of software. He wished there was a full-fledged data base program available and more sophisticated communications software.

**AST brings you
the perfect 4-5-6 for
your Lotus 1-2-3.**

Introducing The MegaGraph™ Graphics Card.

Lotus 1-2-3 is probably the most-used productivity software package in the world. Now you can display 1280 graphics on your IBM monochrome display.

That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display. Your Lotus 1-2-3 spreadsheets reach more than 100 columns. Your Lotus spreadsheets reach more than 100 rows. Your Lotus spreadsheets reach more than 100 columns. Your Lotus spreadsheets reach more than 100 rows.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

makes IBM's great monitor as popular. You can see your spreadsheets on a 1280x1024 monitor.

Lotus 1-2-3 is probably the most-used productivity software package in the world. Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

Now you can display 1280 graphics on your IBM monochrome display. That's why AST developed MegaGraph™ for the IBM PC and XT. It replaces IBM's monochrome card, providing high-resolution bit-mapped graphics and 1280 on the monochrome display.

AST

printer releases or contact AST International, Inc., 2311 Allen Ave., Irvine, CA 92714. (714) 835-1233. TWX: 909-927-1111.

AST



FIRST CONCEPT TECHNOLOGIES, INC.

Announces

INTERCHANGE/1

The complete Micro to Mainframe Data Link.
Available for installation TODAY.

INTERCHANGE/1 allows personal computer users complete access to mainframe data. PC programs can treat that data as if it were actually stored on the personal computer. ADABAS, IDMS, TOTAL and VSAM files can be accessed with simple GET, INSERT, UPDATE and DELETE commands, from standard PC programming languages.

INTERCHANGE/1 is the complete micro to mainframe link. It requires no special PC "database language", but instead extends PC BASIC and PASCAL by adding database manipulation commands. Several mainframe files may be accessed from a single PC program.

INTERCHANGE/1 supplies records on request, without the need for full file transfer, just as normal PC file processing does. It also allows sophisticated data "queries" through its programmatic "GET MATCH" command. You supply the criteria, INTERCHANGE/1 returns only those records which meet that criteria.

Where full file transfer is necessary INTERCHANGE/1 provides both an UPLOAD and a DOWNLOAD utility. UPLOAD can be used to enter records interactively from the PC, or to transfer records from a PC file to the mainframe database. DOWNLOAD will allow transfer of mainframe files to the PC and will even prompt for MATCH criteria so that only the desired records are transferred.

INTERCHANGE/1 includes both the micro and mainframe interface. No user written mainframe program is required. Full mainframe security is provided and can be controlled at the central computer. The Data Center determines which fields in a file may be accessed by a particular user and assigns passwords to control the level of access (READ-ONLY, UPDATE, INSERT/DELETE).

INTERCHANGE/1 is a true micro to mainframe interface because it treats the microcomputer as an equal, not as a 3270 terminal.

INTERCHANGE/1 is the first in our CONTINUUM series of products for Distributed Data Processing (DDP). We are committed to supporting a true DDP environment.

INTERCHANGE/1 forms the basis for an integrated distributed resource system.

INTERCHANGE/1 currently supports mainframe ADABAS, IDMS, TOTAL and VSAM files and interfaces with the IBM Personal Computer. Support for additional mainframe database products, additional microcomputers (Apple, Wang) and additional "mainframes" (VAX, BURROUGHS, DATA GENERAL) are under development. Call us for details or special requests. If we don't have it now, we will build it for you.

Within the next several months, at least a dozen micro/mainframe links will be announced by other manufacturers. To help you in evaluating the products which have been, or will be announced, we have prepared a booklet, in easy to understand "laymen's" terms, titled:

"All you need to Know about the
Micro to Mainframe Link -
Questions to ask your vendor."

The booklet describes what is necessary in a true micro to mainframe link, and explains some of the terms used to describe the various versions available. It will help you to determine what level of link you require for your environment.

For your free copy of our booklet call Toll Free
1-800-448-3400

or
1-800-962-5000 (in New York)
or return the coupon provided below

To further assist your finding a product to meet your needs, WE have provided a list of those vendors we know who have already announced or will be announcing some form of micro to mainframe link. It is not exhaustive, and WE invite any vendor we miss to let us know, so we can include them in our next ad.

"Our Competition"

Incom Systems, Inc. (Cincinnati, OH)
Computer Automation (Richardson, Tx)
Computer Corporation of America (Cambridge, Ma)
Cullinet Software (Westwood, Ma)
Informatica General Corporation (Fairfield, N.J.)
Intel Corporation (Santa Clara, Ca)
National Data Corporation (Fairfield, N.J.)
On-Line Software International (Fort Lee, N.J.)
PCI (Woodland Hills, Ca)
Relay Software, Inc. (Columbia, S.C.)
Software AG of North America (Reston, Va.)

To receive your free copy of our booklet:
"All you need to know about the Micro to Mainframe
Link - Questions to ask your vendor."
Call Toll Free 1-800-448-3400 or
(in New York) 1-800-962-5000 or
return this coupon below:

FIRST CONCEPT TECHNOLOGIES, INC.
P.O. Box 23510
Rochester, New York 14692

Please send me your booklet on the
Micro to Mainframe Link

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
PHONE _____
Mainframe Database used _____
Micro used _____

The Best Today...
...and Tomorrow

FIRST CONCEPT
TECHNOLOGIES, INC.
P.O. BOX 23510
ROCHESTER, N.Y. 14692

Touch screens touted for giving managers

By James B. Ligon
Special to CWS

Desktop computers are invading corporate America. Their use is spreading out from a base of dedicated technical users, branching both up the corporate ladder and out through middle management. These new users are inexperienced at data processing, since they use their computers only for certain specific — and often cryptical — applications. Rather than ingesting data, these managers need to be able to access and manipulate existing data. To them, data processing is not a job, but merely a means to an end.

To gain quick and efficient access and use of this data, corporate users are demanding data processing systems that take little time to learn, are faster to operate and are intuitive in nature — drawing little mental effort and time away from their duties as executives. New types of input and screen manipulation devices are one way that these demands are being met. Their purpose is to provide users with a way to reduce the use of or bypass the keyboard, which has long been an obstacle to the personal computer's penetration of the managerial market.

Important development

Touch screens are one of the latest and potentially most important developments in this trend toward new pointing devices. They allow users to select from menus, position the cursor and create or manipulate graphics by touching the screen. With the recent introduction of several touch computers and monitors, touch technology has generated a fair amount of interest in the corporate market.

Touch screens have two major applications areas in corporate computer environments — access and retrieval of information from corporate data bases and supplementing the keyboard in the use of productivity tools such as spreadsheets and word processing packages.

First, the touch screen is ideal for data base access. Generally, the corporate user needs to sift through or manipulate previously entered data in ways that do not require further keyboarding. With a touch screen, commands and procedures do not have to be memorized, and the user's eyes can stay focused on the screen at all times. In data base applications, the touch screen provides a natural interface to the data, making it available to a broader audience.

Integrating touch into corporate systems can be fairly easy, particularly if the applications software is well written and easily structured and thus easily adaptable. Extensive software tool kits are now available that allow the user to add graphics and touch front-end interfaces to existing applications software or build them into new packages. These tools use the touch screen in their programming process.

Touch screens can be used in the corporate setting as interfaces to microcomputer productivity tools such as spreadsheets and word processing packages. Here, the touch screen serves as a cure for command amnesia — the inability of the user to remember a different series of key-

stroke commands for each software package he uses. Touch gives the user a fast way to move the cursor around the screen.

The touch screen also has specific, time-saving applications for everyday office tasks. For instance, if quick calculations are needed to add to a document being created on the computer, the user may bring up an actual calculator in a portion of the screen, complete the calculations and insert the number into the text. Also, users with ever-changing daily schedules can keep their schedules on the computer and manipulate time blocks accordingly.

Several questions are common to potential touch-screen users. Most are easily addressed.

Many potential users are concerned that they may develop arm fatigue, due to the constant reaching motion used to touch the screen. Here, the design of the touch-screen system is very important. A screen placed at eye level is easy to view, but requires constant lifting of the arm, which can be tiring.

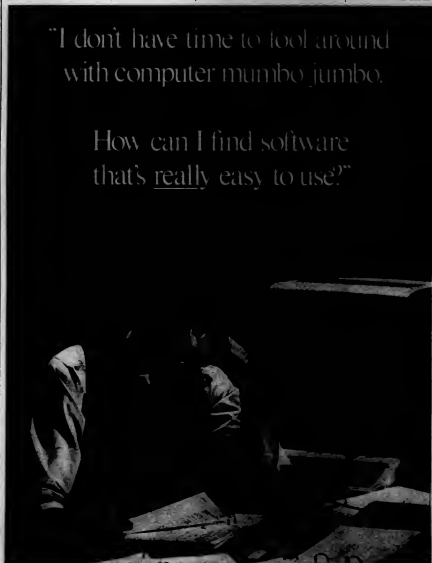
A more practical location for the touch screen is low on the desk and close to the user. By tilting the display and touch screen back about 35 degrees, the unit will also be easy to

view and will be positioned at an angle to allow easy hand movement over the screen. When a keyboard is used, it should be placed as close as possible to the touch-screen unit to minimize the distance the hand has to travel between the two devices.

Another common concern is whether the screen will remain clean. Since many nontouch CRT terminals are often covered with fingerprints, users feel that touch screens may suffer the same problem. However, the use of the proper coating materials will prevent most touch displays from becoming easily covered with visible fingerprints. But if cleaning is

"I don't have time to fool around
with computer mumbo jumbo."

How can I find software
that's really easy to use?"



quick access to data

necessary, it is easily done with an off-the-shelf window cleaning product.

Potential touch-screen users also ask whether the finger tends to block the user's view of the screen. This should not be a problem in well-designed touch-screen software. When moved with the fingertip, the cursor is offset slightly above the finger, allowing it to be seen while it is manipulated on the screen. With touch menu selection, the target blocks are larger than the finger and are always visible. These blocks also may only be touched for a brief moment. Generally, the hand is no more in the way

when using the touch screen than when one is writing on paper.

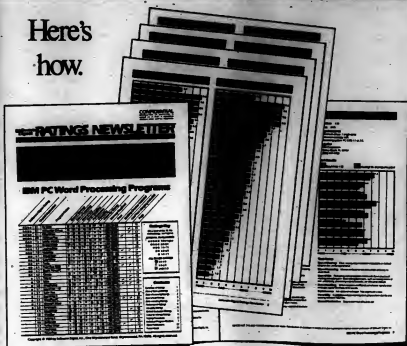
Touch screens will become more accepted for use in big business as general-purpose software begins to support the technology and as corporations are able to add touch screens to their existing in-house computer systems.

Ultimately, touch screens will play a key role in the microcomputer's evolution as an indispensable tool — like the photocopier or the stapler — and as easy to use.

Logan is president of Microtouch Systems, Inc., a Woburn, Mass.-based vendor of touch-screen systems.



Here's how.



If you're an IBM PC user, or are about to become one, the fastest way to find the programs that really are easy to use is to subscribe to the Software Digest Ratings Newsletter.

It cuts through conflicting claims, spots programs that can cause you grief and steers you straight to software that can make your life simpler.

Software Digest ratings are based exclusively on reliable, multiple user tests. Each program is put through the same series of tests TEN TIMES—by ten different people—and their scores are averaged to insure unbiased ratings.

The reports are concise. The ratings are graphic. There's a minimum of words. And no advertising. Just objective test results, comparison charts and hard facts to help you select the right software.

All reports about competitive programs are in the same issue for easy reference. And you can have this unique service for a full year at less than the cost of one disappointing program.

Input devices offer options

Besides touch, alternative input devices currently available include the mouse, graphics tablets, light pens and even voice. The mouse, one of the most popular alternatives to date, is a small plastic device attached to the computer by a short cable. The cursor moves on the screen when the mouse is moved over a smooth surface, such as a desk.

Although the mouse performs the same function as the touch screen at a somewhat lower cost, it requires the user to look up at the screen while rolling the mouse on a different surface. This process takes a certain amount of coordination and mental energy to translate images from one plane to another.

The mouse is also considered a relative input device — meaning that the user must move the cursor from where it is on the screen to where he wants it to be. Touch, on the other hand, is absolute. The user need only touch the place on the screen where the cursor needs to be, and it will jump to that spot. Finally, the mouse takes up valuable desktop space and can be buried under desk clutter.

Graphics tablets are opaque digitizers that sit on a desktop and are generally activated by a special stylus. Like the mouse, the graphics tablet requires an extra layer of mental activity.

Light pens are light-sensitive stylus that give the user a direct interface to the screen. Though some are inexpensive, high-quality light pens actually cost more than a mouse. The actual handling of the pen can be a major disadvantage for the user, since it forces the user to take the extra step of picking up and putting down the pen to perform any function. Direct voice input to a personal computer is also available. Though many consider voice to be the ultimate natural interface, a commonly overlooked disadvantage to voice is the difficulty of formulating precise verbal commands. For instance, if the user is changing the order of a column of numbers, it is much easier to point and move each number to its new spot than to tell the computer verbally where to move each number. Also, imagine the noise clutter in a work space with 10 executives simultaneously giving verbal commands to their personal computers.

First issue FREE

Subscribe now, and we'll send you our complete word processing issue FREE. Your paid subscription will begin with the second issue, covering data management programs. The charter subscription rate is \$15 per year. That's only \$3.50 per issue—a great value considering how much time, money and frustration the unique rating service will save you. And your satisfaction is fully guaranteed.

CREDIT CARD ORDERS CALL TOLL-FREE

1-800-223-7093 In Penna. call 1-600-223-3516

Software Digest One Wyomond Road, Wyomond, PA 19086	
Please enter my subscription to The Software Digest at the charter subscription rate of \$15 per year, and send me the first issue FREE. If not satisfied, I may cancel anytime after receiving the second issue and receive a prompt refund for all unexpired issues.	
Name _____	
Address _____	
City/State/Zip _____	
<input type="checkbox"/> Payment enclosed <input type="checkbox"/> American Express <input type="checkbox"/> MasterCard <input type="checkbox"/> VISA	
Card No. _____ Exp. Date _____	Signature _____ STSC

SPECIAL REPORT

Touch offers variety of technologies



Three important touch-screen technologies are currently available: capacitive, infrared and resistive membrane. Each offers advantages and disadvantages with respect to cost, operating characteristics and resolution.

Capacitive screens detect touches by measuring the changes in capacitance of predefined touch pads on a glass faciplata. With infrared screens, the touch breaks a grid of intersecting infrared beams that are generated and detected by LEDs and reporters. Resistive membrane touch screens detect touch locations by measuring voltage drops across a sandwich of two transparent sheets coated with resistive material.

Pressing on the top sheet establishes contact with the bottom sheet, allowing it to sense the voltage at the touch location.

Touch-screen systems vary in cost, depending on the degree of hardware integration necessary, the quality of the product and the technology used.

The operating characteristics of each technology are also different. The capacitive and infrared approaches are both affected by environmental factors. Capacitive screens are affected by wide ranges of humidity and temperature. With infrared systems, ambient light can cause misreadings, and rough han-

dling of the system can cause the light beams to misalign.

Infrared technology is particularly affected by parallax — the problem of aiming for one point on the screen, but having the system detect a touch at a different location. Parallax is caused by the gap between the plane of the LEDs and the CRT terminal's glass surface. The problem can be especially apparent in the corners of the screen. Both capacitive and resistive membrane screens have minimal parallax problems, since their touch-sensing surfaces conform to those of the terminal.

A stylus can be used to varying degrees with some types of touch screens. Capacitive screens only work with one's finger, while infrared screens work by probing with a finger or a stylus. A narrow stylus such as a pencil, however, will not always produce a reading with infrared, since it can pass between the beams without breaking them. A stylus may be used with the resistive membrane type, although a sharp object can scratch the screen if used improperly.

Resolution important

Of all performance criteria for touch screens, the most important is resolution. Basically, resolution is defined by the number of distinct areas on the screen that can be recognized by the monitor as unique touch points. Higher resolutions are permitting touch screens to compete for the first time with the mouse and other pointing devices and are attracting new touch-screen users. Resolution varies widely across touch technologies — a fact that has important implications for the use of different touch-screen types in corporate applications.

Capacitive screens have the lowest touch-screen resolution, generally limited to the number (usually 52) of touch areas etched onto the glass. This low resolution severely restricts the flexibility of the software with which the capacitive screen operates.

For infrared screens, the maximum resolution is roughly 40 by 27 touch points. This is adequate for menu selection, but too low and imprecise for the higher precision needs of most corporate application programs. Infrared screens allow the user to select 5- by 5-in.-type cards and other large targets, but require the use of the keyboard's arrow keys to specify a single word or character in a word processing application after the general location has been identified with the touch screen.

The resistive membrane touch screens, due to its analog nature, allows for resolutions as high as 1,024 by 1,024 touch points — higher than the display resolution of most CRT terminals. Because the entire area that is touched can be averaged out to a specific touch point, even a stylus as large as a person's finger can be used to manipulate objects as small as a single letter accurately.

Touch screens work well with the visual operating environments now being offered for microcomputers. They enable users to open and close windows, select from pop-up menus and cut and paste data — all by touching the screen directly.



UNIX™ HORSEPOWER!

There are a lot of UNIX based systems on the market today claiming to be "SUPERMICROS". But do they really have what it takes to run multi-user UNIX well? The IBC ENSIGN™ does and here's why:

FAST MEMORY: No computer running at any clock speed can run faster than IBC's overall memory design. The ENSIGN has up to 512K of 120ns/c memory with dual bit error correction. With IBC's proprietary memory management, all of this memory runs with no wait states as fast as the 68000 CPU will go. Compare this to other systems running only small cache memories at full speed. Other multiple user systems cannot load all their programs into a small cache memory. Their systems slow down considerably under a heavy multi-user load.

RELIABLE IBC I/O CONTROLLER: Even the fastest CPU will slow down when it's trying to handle interruptions from multiple on-line users. The ENSIGN provides slave serial I/O CPUs and RPO buffering for both input and output. The result is the ENSIGN's ability to support up to 32 users, with heavy serial I/O demand, while leaving the main 68000 CPU free to run with little serial I/O overhead.

RELIABLE IBC CONTROLLER AND HIGH PERFORMANCE PERIPHERALS: The ENSIGN has a slave CPU to handle all disk operations, plus 16K of disk buffering. IBC's proprietary disk DMA allows high speed data transfer to main memory without slowing down the main CPU. Further, the ENSIGN

supports SMD type 8" hard disks with much faster seek times and transfer rates than 5 1/4" hard disks usually found in personal desk top computers.

THE RESULTS: The IBC ENSIGN runs multi-user UNIX at performance levels not attainable by other supermicros.

Call IBC and get a copy of

IBC's multi-user benchmarks—benchmarks that test 8 users running large CPU programs, with heavy disk I/O and heavy serial I/O simultaneously. You'll find that nothing can compare to the ENSIGN.

If you want to run multi-user UNIX on a high performance system with up to 32 users, 8MB memory, and over 1,000MB disk storage, see the IBC ENSIGN.

Outside the USA

IBC
21421 Natchford Street
Chatsworth, CA 91311
(818) 882-9007
Telex No. 215349

UNIX is a trademark of Bell Laboratories

Within the USA

IBC
1140 30th Street Suite 212
Ogden, Utah 84403
(801) 621-2294

See us at Comdex, Atlanta, South 8 Booth

Maintenance: Consider independent service

By John Bennett
Special to CWS

Over the first 18 months of use in a particular organization, many applications do not reach their full potential. Small business has embraced the microcomputer — but only tentatively. The micro is moving from being a "gee whiz" accessory to become the general backbone of a business' operations.

It is at this point that maintenance and repair become significant considerations for the small company, which, before becoming dependent on the system, normally considered the maintenance requirements of a microcomputer as being analogous to those of appliances and entertainment electronics.

If the entire system was purchased from one dealer and all future enhancements and expansions are expected to be bought from him, then the dealer himself is a perfect choice for servicing the equipment.

If the equipment has been purchased from a variety of dealers, by mail-order, secondhand or as part of an application marketed as a total package by an integrator some hundreds of miles away, then the service problem becomes more acute.

Independent maintenance

Independent, third-party maintenance organizations have the capability to repair a wide range of manufacturers' products. Smaller independents, naturally, have more limited product service menus and turn out those machines they cannot handle. Larger independents, however, can handle many different manufacturers and hundreds of various models.

Unlike traditional third-party maintenance, in which technicians service a manufacturer's products on a time-and-materials basis, billing the manufacturer, a few independent service companies offer the end user direct and total access to their organizations.

This variation on the third-party maintenance theme is produced through a program of service and maintenance procedures that the maintenance firm administers under a written agreement to repair an end user's computer equipment.

Usually, these end-user agreements are preceded by a training plan that makes the service firm expert in the repair of a particular manufacturer's products.

The service firm usually makes a sizable investment to acquire spare printed-circuit boards, mechanical assemblies and other parts. These are integrated into the

company's parts inventory tracking system. That equipment is secured. Technicians are trained on the computer equipment down to the microprocessor chip level. Field service representatives are then trained by the company's instructors.

At this point, long-term

maintenance contracts can be written directly with end users. Installation, warranty, carry-in and mail-in services are also usually available.

Maintenance and repair service are still in the process of change. They are still growing out of older concepts

and into product areas that change almost daily. The range of services offered and the products to which these services are applied are changing all the time.

Many have found that computerization is much more than merely pushing a button, and they are also dis-

covering that service for an entire system can, if not planned well, be significantly more complex than a mere telephone call.

Bennett is director of planning and development for TRW, Inc.'s Customer Service Division in Fairfield, N.J.

Are you interested in THE HARRIS RESOURCE?

☐ Please have a sales representative contact me at phone

☐ Please send information.

Name _____

Title _____

Organization _____

Address _____

City _____

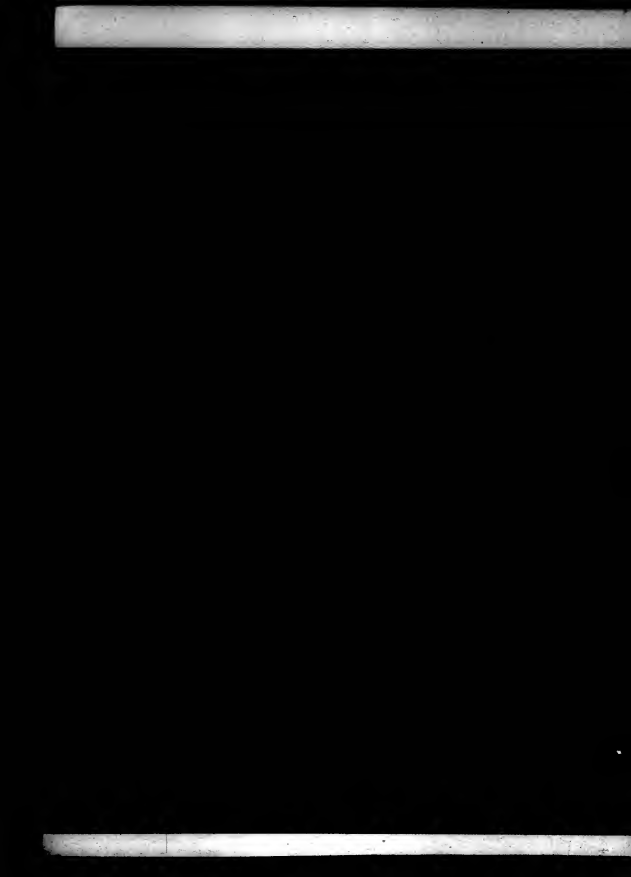
State _____ Zip _____

THE HARRIS RESOURCE
PROVIDER is a trademark of
Powers Data Systems, Inc.



Whitehouse Place
10 East Ridge Pike
Cranford, NJ 07016
212-522-0252

Personal
Only
System
Inc. 212-522-0252



Make the connection with the company who needs it.

At the time you need it, we help you quickly transfer data between the host. So you can take advantage of the PC's processing power. While keeping connect time to a minimum.

To reduce your applications backlog, we use the H/SPT™ software with our H/SPT interface. It works just like the host software at the PG level. So your program can run on the host. And free up the

host for other users. Our unique H/SPT interface is the only one that provides

the ability to transfer data between the host and the PC. And it's the only one that provides

Leasing micros provides support solution

By Philip K. Shell
Special to CWS

The people who brought us the personal computer revolution have put a vast array of new, increasingly sophisticated hardware and software at the disposal of today's businesses. What they have not done is provide

corporate users with a comparable degree of service and support.

Service and support are the elements that make it easier to select, acquire, configure, install, maintain, upgrade and control personal computers and peripherals in business.

Manufacturers, for the most part, do an excellent job of designing and producing computer equipment. Software publishers offer a large variety of functional packages. And retailers do an excellent job of bringing that equipment to the market and to the end user.

None of these industry groups, however, puts all the pieces of the puzzle together for corporate personal computer users.

Doing so requires attention to four key corporate needs:

■ The need for prompt delivery.

■ The need for ongoing equipment servicing on-site.

■ The need for ongoing equipment servicing on-site.

■ The need for comprehensive invoicing information.

Value-added leasing was developed to meet these needs as well as the need for application software. Value-added leasing of personal computers also enables companies to assume nearly total control over their personal computer environments.

For corporate users, such a soup-to-nuts leasing arrangement can be a viable alternative to purchase. It offers the following advantages:

■ Equipment. Ready availability of state-of-the-art products.

■ Configuration. Expert assistance in assembling the particular combinations needed for certain applications: the appropriate amount of memory, the desired disk storage and the necessary communications devices.

■ Software. Delivery of the software needed for particular applications, whether what is needed be off the shelf or a custom-written package.

■ Delivery. Equipment is ready at the customer site usually within five days of the order. In special situations, that equipment may even be delivered in as little as 24 hours.

■ Installation. Equipment is installed, put on-line and given a complete run-through at the client's location.

■ Billing. Invoices for corporate users, especially those with a large number of personal computers, need to be detailed and accurate.

■ Service. Immediate service is rendered on the client's premises, a marked improvement over service arrangements requiring the user to deliver a unit back to the manufacturer.

■ Upgrading. Replacement of leased equipment with new, state-of-the-art equipment can be done at any time, at no added charge.

These elements, together with software tailored to a particular corporate application, give the corporation the ability to operate with greater flexibility, efficiency and control than might otherwise be possible.

The key lies not just in one area, but rather in simultaneous attention to hardware, software, service, configuration needs and administrative detail.

Cloft is president of Selecterm, Inc., a Danvers, Mass.-based leaser of personal computers.

Buy the system for unmatched flexibility.

From Apples to Zeniths, OMNINET handles more types of micros than any other network. So keep the DEC's in Data Processing and the PC's in Purchasing. OMNINET makes for great working relationships. And starting with

options like email, your people can choose from over 500 different services according to their needs. No more

Buy us for our experience.

We pioneered local area networking for micros. And we're constantly working on better ways to give you the system you need, with the versatility you want, at a price that makes sense.

With the result that 3 out of every 5 locally-networked micros in the world are connected to a CORVUS network.

Give us a call at 800-4-CORVUS to find out more.

Because when it's all said and done, one of the best arguments for going with an OMNINET Network is really very simple.

Buy it for your peace of mind.

CORVUS
The Networking Company.

© 1984 by The Networking Company, Inc. All rights reserved. CORVUS and OMNINET are registered trademarks of The Networking Company, Inc. and are used under license by Selecterm, Inc. All other trademarks are the property of their respective owners. Selecterm, Inc. is a Danvers, Mass.-based leaser of personal computers.

EVERYONE WHO WANTS TO USE THE COMPANY MAINFRAME RAISE YOUR HAND.

Introducing power to the people.

Better known as the Data Pipeline™ from Intel.

It's based on our iDIS™ Database Information System. A powerful, integrated package of hardware and software with multi-user capability built right in. And now, through iDIS, just about any pc or terminal can easily share data with just about any mainframe.

With the iDIS Pipeline, you'll be able to establish and manage your pc-to-mainframe connections in a way never before possible. Yet you'll still be able to offer department users a fair degree of independence. Since iDIS comes with all

the software they need. Starting with the Xenix® operating system, built around a relational DBMS. Plus the Multiplan® spreadsheet, word processing, electronic mail, and a forms/menu development tool.

The iDIS Pipeline is powerful, too. Each one will handle 5 full-time users, or between 12 and 15 on dial-up. And you can even network with other iDIS systems. But you're always in control. You decide which data are

accessible, and extract only those to your iDIS system. Users then access their data sets from iDIS's hard disk.

Actually, using the iDIS Pipeline is a lot like giving users their own little mainframe.

Which is a lot better than giving them yours.

It's also a lot cheaper.

Less than half the cost of a direct pc-to-mainframe connection.

It's also fully supported and serviced from one responsive source. Us. Best of all, it's available now.

For more information about how our iDIS Data Pipeline can help you manage the revolution in your office, call us at 800-538-1876; in California, 800-672-1833. Or write Intel, Lit. Dept. H-18, 3065 Bowers Ave., Santa Clara, CA 95051.

Of course, if you're undecided about what to do you can always ask for a show of hands...

intel



Electric firm sheds light on its business with

DALLAS — In an effort to shed light on its business with computer-aided modeling and reporting techniques, more than 200 microcomputers are used for reports and models by staff analysts, accountants and engineers at Central and South West Corp. (CSW) here.

CSW, with 1983 revenues of \$2.6 billion and earnings of \$367 million, ranks as one of the largest electric systems in the U.S. Servicing 1.5 million customers, it owns four electric operating subsidiaries that serve portions of Texas, Oklahoma, Louisiana and Arkansas. It also owns an intrastate natural gas pipeline company and has subsidiaries involved in cogeneration projects and financial investments.

An eighth subsidiary, Central and South West Services (CSWS), supports all of its sister companies with financial, legal, engineering and construction and data processing services. During the last two years, the Information Services Division at CSWS has played a strong role in the growth of microcomputers at the corporation's headquarters here.

Applications growth

With encouragement and technical advice from an information center staff, users of more than 60 personal computers at CSWS have developed applications ranging from cash management and bank balance reporting in the financial area to environmental and geological analysis in support of power plant construction and fuel acquisition. This rapid growth of user applications for personal computers is fully backed by information Services' management.

"Our philosophy for several years has been to help the users help themselves," said Clay Watts, CSWS manager of User and Information Services Support. "Our users have been especially satisfied with the capabilities provided by the personal computers, and they have been extremely creative and productive."

"From a technical standpoint, our users are developing a good understanding of the tools available, both on the mainframe and the personal computers," Watts said. "From there, it's up to them to apply the tools to solve their problems. Our major remaining technical efforts are to provide them with the capability to tie these applications and tools together."

"We're looking at several communications options, including dial-up, Irms (from Technical Analysis Corp.) and a protocol converter. Also, we're been developing a methodology for strategic data planning to improve our ability to coordinate and share data. Until now, the tools and techniques available have seemed very abstract and time-consuming," Watts said.

Within User and Information Services Support are the information center, data systems and documentation services. The information center and data systems staff recently began studying Callinet Software, Inc.'s integrated software to address the data sharing and communications issues.

"The Callinet software may bridge the data base administration concerns with personal computing flexibility," Watts said. "Callinet's Infor-

mation Data Base Catalog allows an organization to describe dynamically relationships among users, groups of users, files and groups of files. The catalog design defines a network of data and text files residing on the mainframe or personal computer.

"The network can be accessed by users with a set of personal computer tools including spreadsheet, word processing, graphics and relational data base management. In addition, a user can have complete control over who has access to the data," Watts maintained.



The information center at CSWS offers its users the freedom to access the best and to share data across departments. The information center is equipped with mainframe tools like IBM's TSO, Applied Digital Research, Inc.'s Rascal and SAS Institute, Inc.'s SAS/Graph. By integrating these tools, the information center can accomplish its primary goal — helping users do a better job.

Most users begin exploring their options in the information center. The center is equipped with a variety of terminal devices and graphics-oriented peripherals. Six IBM Personal

Computers on mobile carts are loaned to users for a few hours or several days. A portable Compaq Computer Corp. micro can be checked out overnight or for the weekend.

"Our basic philosophy of personal computer growth has been to allow users to acquire anything that will run on the IBM Personal Computer," said Bill Garbis, supervisor of the information center at CSWS. "In no case will we restrict users from taking a particular course of action if it is in line with corporate standards and if a business need exists."

Users discuss their needs with an information center consultant. After

Personal Computers have opened up all kinds of possibilities throughout your company. Including some you'd rather not think about. Somehow a balance must be struck between the performance PCs offer, and the control you have to have in a local area network to make sense of the whole system. Somehow, costs, information and information processing resources have to be managed.

INTRODUCING THE NETONE® PERSONAL CONNECTION. IT'S SMART, FAST, AND SNA-COMPATIBLE.

The NetOne Personal Connection™ hardware is a high performance, 10 megabit-per-second, Ethernet-compatible Network Interface Unit (NIU) in a plug-in board for IBM® Personal Computers. It packs enough microprocessing power on a single 52-square-inch board to offload all networking functions, so it doesn't consume any of the host CPU's resources.

With NetOne SNA Server software, a PC can emulate a 3278, and get a direct SNA route to the top. So the Personal Connection is a far-sighted solution when PCs need to share information and peripherals. And it's the only solution when PCs need to be mixed cost effectively into a high-speed corporate network with information processing devices from different manufacturers.

The Personal Connection can do it, because it's the NetOne Personal Connection. That means it not only does the job from PC-to-PC, it's the newest extension of NetOne, the general purpose local area network system that can turn all the equipment you have now, no matter who makes it, into a fully functional, high performance network. A Big Picture network. Broadband, baseband, fiber optics. Mainframe to mini to micro. Local to remote.

Now PCs can get into without getting

NetOne, Personal Connection, NIU, Personal NIU, Distributor and Processor are trademarks of Unigenics-Bell, Inc. IBM is a registered trademark of International Business Machines Corporation.

micro modeling techniques

studying the user's current requirements and future goals, the consultant suggests a configuration to meet current needs without sacrificing compatibility for future applications.

"We explore the options with users, and we encourage them to make the final decisions," Garcia said. "Money for the Personal Computers comes out of their budgets. They understand their business; they should determine how the computer should be used."

"The users recognize that the expertise is here. We build a sense of

mutual trust; and this makes the users very receptive to our recommendations. The final decision is always up to the user, however." The consultants help with all software packages, but they focus their expertise on selected products. Classroom training is available for an electronic spreadsheet — Lotus Development Corp.'s Lotus 1-2-3 — and for two word processing packages — Microsoft, Inc.'s Wordstar and Lotus Software, Inc.'s Wordwriter Deluxe. In addition, classes are scheduled for four complementary graphics products: Decision Re-

sources, Inc.'s Characterizer and Signmaster, PFS:software, Inc.'s PC Crayon and Pictorial-Hall, Inc.'s Easyvision. Careful product selection earns respect for the information center staff, Garcia explained. If the staff were to scatter its energies and seek a little bit of knowledge about all IBM-compatible products,

the information center would appear more like a group of hobbyists. The staff avoids the label by carefully evaluating new methods to access corporate data.

The information center and the data systems staff were reorganized in June 1983. The reorganization created three other User and Information Services Support departments: the Data Center, Applications Development and Planning and Assurance (see chart above).

All departments use some Personal Computers, whether for IBM S/378 replacement, text processing, spreadsheet, graphics or other purpose. There has been no pressure to use the micros; instead, interest has grown steadily as User and Information Services staff members see what personal computers can do.

Applications Development has established a development center to promote productivity tools for analysts and programmers. The development center typically is the first to use a new tool in a significant application, such as Basic programming on the personal computer or Cullinet's fourth-generation language, AD/On-Line, on the mainframe computer.

Integration of philosophies

"Because of the personal computers, users are more knowledgeable about the development process," said Cathy Means, CSWS manager of applications development. "They want a prototype instead of following the traditional methodology of analysis, design and implementation. We are trying to integrate the new technologies with the traditional philosophy so that users can implement a solution more quickly."

Unlike the information center, the development center does not handle ad hoc end-user requests for assistance. Instead, the development center selects more complex user problems relating to system analysis, design and programming.

The development center first used the microcomputer as an interactive data entry/editor on the front end of a batch-oriented purchased application package. Batches of transactions were created on the Personal Computer and uploaded to the host using Boscoe or TRD. Then the appropriate job control language was added and submitted for batch processing.

"We intend to educate users in the advantages of normalizing data files," Watts claimed. "This, combined with a fully integrated data dictionary and the ability to access existing mainframe data, may give users the ability to control their applications and data while ensuring that information is used effectively throughout the corporation."

IT'S POWERFUL ENOUGH TO PERFORM IN HEAVY TRAFFIC.

The Personal Connection is impressive even if all you need to do now is hook up a few PCs. Our Diskshare™ software lets one PC act as a disk server and still function fully as a PC. A Printshare™ program lets a number of PCs share a printer effectively. Because the Personal Connection offloads networking functions completely, you're getting every ounce of performance from every machine as well as maximum network performance.

When you connect more than just a few PCs, or a few hundred, the Personal Connection's on-board intelligence and 10 Mbps transmission speed are more than impressive. They're critical.

The ability to handle heavy traffic, fast, and to fully integrate PCs into your corporate network—now, or later—gives you both the high performance and the manageability you need, no matter how many PCs come in the door. You get the shared access, fast response, and easy, transparent operation you're looking for. And you get better management of file storage, applications software, and costs.

HOW MUCH WOULD YOU PAY FOR A BOARD THAT DID ALL THAT? The Net/One Personal Connection board (Personal NIU™) and operating software are \$850. Surprised?

If you're looking to harness PCs to a high performance network, or trying to solve networking problems of any kind, give us a call. Ungermann-Bass, Inc., 2560 Mission College Boulevard, Santa Clara, California 95050. Telephone (408) 496-0111.

Net/One from Ungermann-Bass

the corporate network out of control.

Soup up your Volkswriter.



Everybody knows Volkswriter, the word processing software package that's become synonymous with high performance. Now, there's a way to get even higher mileage out of your Volkswriter. Hook it up to a Dataproducts P Series dot matrix color printer.

The versatile P Series translates the executive class, word processing capabilities of the Volkswriter into brilliant full color charts, graphs and text. It delivers a full page of text quality

print in nothing flat while its sheet feeder automatically prevents loading hassles. And the P Series uses pin feed or plain paper and has the brains to fill every appropriate line with crisp, sharp copy, even if it has to justify to do it. And the P Series color printer has dual speed capability for

correspondence quality output for the Volkswriter's many word processing applications and high speed output for draft and spreadsheets.

The Dataproducts P Series color printer. Think of us as a supercharger for your Volkswriter.

For more information go to your nearest computer store and ask about the Dataproducts P Series color printer, or call Dataproducts, 1-800-258-1386.



Dataproducts computer printers

Nobody puts ideas on paper so many ways.

Volkswriter is a registered trademark of LIFETIME SOFTWARE, INC.

SPECIAL REPORT

CHAOS

every office of every department, along with software that can do anything and everything. More hardware and software vendors are welcomed with open arms when they come to demonstrate products, and users are apog over all the wonderful things these machines can do. The users believe that if they find the right vendor,

they really will have the chance to achieve complete freedom from the DP department and be able to control their own destiny.

The advent of micro in the business environment and the resultant enthusiasm of users have been distressing to DP departments of many corporations. The general feeling of DPs is that users do not know what they are getting into, that they are

ignorant and naïve.

Then there are those users who are having a fair amount of success, and this does not go unnoticed by corporate management. Word processing, spreadsheet processing and electronic mail applications are being met with initial approval. These user-installed applications have cut corporate costs, boosted worker efficiency and productivity and con-

tributed to an enhanced office environment. With each success, the user is encouraged to continue the process of office mechanization and to increase the resources to do a bigger and better job.

This is where corporate management must now exercise a careful decision process to ensure that data processing is controlled within the business. Some firms have recognized that it is

necessary to set up an information center so that users can have access to copies of mainframe production data. Also, some firms have recognized the need for an office automation team to coordinate the mechanization of certain business functions.

Primary objectives of controlling data processing should be:

- To prevent the redundancy of DP processes and applications.

- To avoid the incompatibility of hardware and software.

- To deal with the tendency of users to break ties with the DP department.

- To plan for the possibility of applications going seriously awry due to inexperienced and ineffective methodologies by users.

As each department within the corporation discovers that it can accomplish great things by computerizing its work, corporate management must remain alert to maintain DP control. Certain signals must be recognized that may indicate control is being lost. Comments such as the following from non-DPs, or user computer wizards, within the corporation might be worth a second look:

- "We've asked the users in our department to refrain from purchasing more mice until they talk with us. Our unit might be able to help them out."

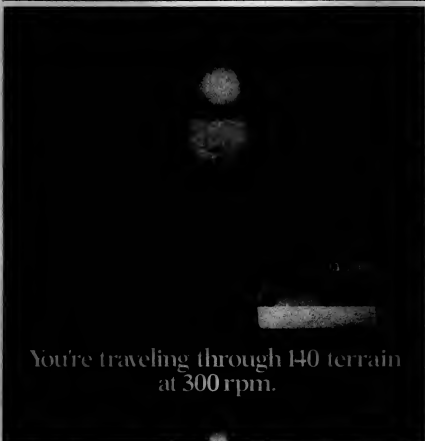
- "Our department has decided to hire a couple of programmers to implement an application we want."

- "The programmers we hired for our department know what they are doing and don't fool around. They get our applications up and running in no time."

- "The data systems department said it would take \$200,000 and 2½ years to implement the application. We did it in three months for \$30,000."

The reality of the situation as it exists in today's corporation must also be taken into account when considering DP control. First of all, the micro in the corporate environment is here to stay. No micro user or smart manager would ever give up a tool that appears to save the firm money. Likewise, departments that have set up a DP shop are not about to turn in their hardware. The DP department cannot necessarily be expected to discard its professionalism for expediency, but the DP department should expect that there will be others in the firm who will also be given authority for DP responsibility.

As time goes on, it can be expected that more DP responsibility will be given to those outside the DP department, especially as micros become more powerful and users become more professionally oriented to the DP area.



You're traveling through 140 terrain at 300 rpm.

Only one disk guarantees safe passage through the torrid zone of drive heat. Maxell.

A lifetime warranty. And manufacturing standards that make it almost unnecessary.

Consider this: Every time you take your disk for a little spin, you expose it to drive heat that can sidetrack data. Worse, take it to the point of no return. Maxell's unique jacket construction defies heat of 140°F. And keeps your information on track.

And Maxell runs clean. A unique process impregnates lubricants throughout the oxide layer. Extending media and head life. How good is Gold?

Maxell's the disk that many drive manufacturers trust to put new equipment through its paces. It's that bug-free.

So you can drive a bargain. But in accelerated tests, Maxell floppies lead the industry in error-free performance and durability. Proving that if you can't stand the heat you don't stand a chance.

maxell.
IT'S WORTH IT

Maxell Corporation of America, 40 Oxford Drive, New Canaan, N.J. 07641-2001

Mainframe tie signals end of stand-alone micro

By Charles Moore
Special to CWS

This may be the end of personal computers used as stand-alone machines in corporate environments. The introduction of sophisticated multifunction applications software has given personal computers the capability to serve as true professional workstations.

But the promise of personal computers as corporate productivity tools will not be fully realized until users can instantly and cost-effectively access information residing on the company's mainframe computer.

Because of the growing number of software and hardware products to link personal computers to mainframes, the selection of one method over another is not always a simple decision.

Linking methods

One of the earliest means of linking personal computers to mainframes was through asynchronous or start/stop terminal emulation software. While probably the most common communications link, it is relatively slow (300 to 1,500 bit/sec) compared with other types of products.

A more recent method is personal computer communications software. This enables the personal computer user to access data selectively from the mainframe computer and download it.

Installing a coaxial cable for a direct hookup between the mainframe and the personal computer is a faster, more cost-effective method and one that is growing in popularity, especially with companies that have an installed IBM 3270 network.

An interface board plugs into the personal computer and is connected to the mainframe via coaxial cable to a 3274/3276 cluster controller. Each controller, which may be channel-attached or on a communications line, can handle a number of terminals or personal computers emulating terminals.

Cluster controllers can also be remotely attached using the Binary Synchronous Communications or the Systems Network Architecture (SNA)/Synchronous Data Link Control protocols through communications controllers or front-end processors such as the IBM 3705 or 3725.

The cost of emulator hardware and software must be applied to each personal computer equipped to communicate with the mainframe. But the cost of the cluster controller and the other hardware needed at the mainframe end can be spread over the number of terminals and

personal computers that are attached.

The maintenance cost for networks that employ emulation of 3273- or 3276-type terminals is low because maintenance can be spread over the number of terminals.

Since the emulator is con-

nected to a cluster controller under personal computer program control, connecting to the host is as simple as running the appropriate software in the personal computer.

Micro-to-mainframe communications promises major technological breakthroughs.

Innovative companies are moving rapidly in SNA communications technology to provide the products necessary to integrate personal computers with mainframes. As more and more corporations recognize the benefits of integration, personal computers as stand-alone ma-

chines will soon disappear, to be replaced by networked, professional workstations.

Morel is assistant vice-president of research and development at CCI, Inc., a Palo Alto, Calif.-based manufacturer of micro-mainframe communications products.



Risk management policy: Planning for the

By Tim A. Schaback
Special to CWS

It's like giving 10 million people a key to your computer room. By 1984 there will be that many people who have microcomputers and know how to use them — 10 million people who have a "key" to enter a computer system via the telephone.

We all assume nothing bad is going to happen to us. This natural inclination reasons that "it always happens to the other person — not me."

Risk management policy indicates that it is up to the owner (not necessarily the user) of the system and its data to decide what has to be protected and what does not — and if it is to be protected, to

what degree. To determine the level of security required, a threat analysis should be made. The kinds of threats your organization may encounter can be determined by the following:

- Products and services offered by your organization.
- Location — high crime area?
- Environment — flood area, earthquake, volcano?

It is important to remember that any security hardware or software options or physical site security should be cost-justified.

It would not be cost-effective, for example, to install \$30,000 worth of physical security to protect a \$4,000 microcomputer that does not contain highly sensitive or valuable data. The common-sense approach to security needs is the best approach.

Schaback is a senior consultant with Computer Protection Systems, Inc., a Plymouth, Mich., DP security firm.



Why can't some smart kid break into our system and destroy our records?

Why bother?

— Making the decision — security by personnel — approach to security management, the following considerations are offered:

• The sharp rise in the purchase and use of microcomputers in large and small businesses has been relatively uncontrolled.

• Micros are smaller and friendlier than their predecessors — and are also more of a risk. They are usually housed on a desk in an open environment rather than in a secure DP center.

• The security veil that stemmed from ignorance about computers and the technical aspects of DP no longer exists. Micro users are becoming more and more sophisticated, and most have some programming skills.

• One micro may be used by several employees and outside consultants/programmers. The casual operating environment is the rule rather than the exception.

• The preservation of data integrity. If more people have direct interface with a company's central data base, data can become contaminated. Control of the central data base is now more important than it was in the past.

• The prevention of the misuse of company data. There is a potential for data stored, not only on the central data base, but also on micros, minis and office automation equipment, to be copied electronically for unethical or criminal purposes.

• Magnetic media is uncontrolled and unaccounted for.

• A single diskette or cassette has the capability of storing large amounts of sensitive business information. These diskettes are small, readily concealed and can be removed from the area without notice.

• The micro environment has reduced operating controls and audit trails. Separation of duties is oftentimes nonexistent.

• Policies and procedures pertaining to office equipment and DP security, which exist in most large organizations, are often nonexistent in small businesses.



He thought it was the electronic mail machine — turns out it was the paper shredder.

What can happen?

It usually does not take very long for microcomputer users to realize that it is not prudent to leave their micro equipment and magnetic media unprotected against workplace hazards. Over the years, dating back to the first microcomputers and intelligent terminals of a decade ago, there have been a number of what you might call interesting occurrences.

• Diskettes have been used as coasters for coffee cups and soda bottles so that desk or table surfaces would not be damaged.

• Ashtrays are often kept next to or on top of diskettes. Cigarette smoke alone can cause diskette read/write problems. Ashes can cause additional damage not only to the magnetic media, but also to the magnetic recording hardware device.

• To facilitate handling and control, diskettes have been stapled or paper-clipped to source documents or secured with a rubber band to a batch of documents.

• Diskettes and cassettes have been dropped behind desks and file cabinets and on the floor. Some diskettes have the distinct honor of bearing vivid impressions of footprints or of a chair's casters.

• Diskettes and cassettes are inadvertently placed on top of or next to common magnetic office devices such as paper clip holders or magnetic clips, which can cause partial or total erasure of

See HAZARDS SR/37

Adequate security can be achieved through the proper employment of security administration, risk analysis, disaster planning and psychological security.

Physical security, hardware and software security, communications security and good auditing techniques are elements that, if integrated into a sound security plan, can provide a level of protection that meets the needs of any given business.

Control of the organization's microcomputer hardware is an important element of the total microcomputer security environment. Controls include establishing policies and procedures that govern equipment inventory, equipment identification and marking, personnel access to a micro and control of the applications being processed.



We put all our records in the computer to make them easier to keep. Last night somebody broke in and stole the computer.

Inventory logs

Inventory control logs that list the microcomputer's CPU and peripheral devices should be maintained. The following information should be recorded: description of hardware device; model number; memory storage size; manufacturer's serial number; warranty number; warranty date; name, address and telephone number of where item was purchased; date purchased; and your company's identification numbers.

A second log should be maintained that keeps track of the location of each microcomputer and peripheral device. The equipment control log should have the following information: description of device; manufacturer's serial number; company's identification number; current location of the device; date (and time, if required) the equipment was checked in or returned and borrower's signature.

In addition to keeping an inventory log of all equipment, a special identification number should be etched or written with special ink on each device. (Manufacturer's serial numbers are often placed on tags that can be removed from the equipment.)

Personally owned computers should be etched or engraved (with an electric engraver or scribe) with the owner's driver's license number or state identification number. Proceeding that number should be the two-digit state code and a slash. If the system's owner does not have a driver's license or state ID, the home telephone number and area code should be used. The reason the driver's license, state ID or telephone number should be used is to facilitate tracing by the police department in case the unit is stolen.

Microcomputers that are owned by an organization should be etched with the company's name, telephone number and a special ID number. It is wise to mark the equipment in at least two places.

Ultraviolet marking pens are also useful for marking equipment. However, if the units are stolen, most police agencies will not think of using a black light to check the recovered property for ultraviolet markings.

day when it doesn't happen to the other guy

Controls should be established and policies and procedures written that govern access to the microcomputer. It should be made clear to each employee what the exact job is in reference to the microcomputer and the system's applications.

Access to micros should be restricted to only those people who have authorized access, especially when the micros are used to process critical and sensitive information and when they are tied in to a network or mainframe.

There are a number of devices on the market that can be used to provide security for microcomputer equipment.

One such device, an electrical power access control device, places access control on the micro by limiting its use to those individuals who have the key or combination to the power access control unit.

A number of hardware security devices are available that offer the following means of physical

ally securing microcomputer equipment:

- Locking devices that secure the micro to the top of the desk or table surface with bolts or with a special glue.

- Worktables that have a protective security cover that can be placed over the micro when it is not in use.

- Secure cases that house the micro and allow access only by a key that unlocks the case.

Software security involves protecting an organization's operating system and application programs from intentional or unintentional use, alteration or deletion. Protection for software is offered in the form of hardware/software protection devices, control of sensitive programs and program changes, adequate and proper backup and legal protection.

In a network or micro-to-mainframe linked environment, software security at both the micro and the mainframe and becomes even more critical.

Because of the micro's storage and copying capabilities, stringent mainframe security policies and access controls should be installed and working properly.

A few hardware/software devices are available

that protect a company's microcomputer software from being copied or run on another's system. One such unit allows software to be copied, but to run only on machines with a hardware security device plugged into the game port socket. The security device manufacturer supplies each software company with a series of access keys that are unique to that particular company. A special feature provides for self-destruction of the access key logic if anyone tries to tamper with the device.

Security software packages and routines for microcomputers are currently very limited and usually provide only access control via menu security or password schemes. These packages and routines are generally provided by the manufacturer of the hardware or operating system.

Microcomputer systems overhead in terms of storage and system resources usually cannot support any significant security packages or routines while other applications are being processed.

See SECURITY S/37



Fire

Although CRT and microcomputer fires are extremely rare, areas where microcomputers are used should have hand-operated extinguishers available for use if necessary. The extinguishers should be clearly marked, possibly with a red-painted area on the wall, and the path to them should not be blocked.

Extinguishers should be clearly marked as to the type of fire for which they can be used. They should also be checked periodically for correct operation and for the correct amount of pressure.

CO₂ extinguishers are recommended for micro-related fires. Microcomputer vendors suggest that if the micro starts smoking — leave it alone. The problem will probably extinguish itself quickly. If there is evidence of heat or if a flame is visible, direct the CO₂ extinguisher contents through the vent openings in the micro's cabinet.

Do not apply the CO₂ gas directly to the face of the CRT. Application of CO₂ to the glass surface of the CRT can cause the glass to shatter. As a result, there may be an explosion in which outside air rushes into the now-ruptured vacuum within the tube and bounces back. This action can propel fragments of tube glass more than 18 inches away from the face of the screen.



Where did that come from?

Auditors

A few years ago, auditors were wondering how to establish and implement audit controls for the microcomputer.

Now auditors are faced with a much more critical dilemma — the microcomputer. These auditors who are working at establishing controls in the microcomputer area are running into the following problems:

- Microcomputer software packages do not have adequate accounting controls or audit trails.

- The small business with one micro does not have the time or money to spend on audit controls.

- Auditors are now not only faced with what controls to establish in the stand-alone micro environment, but also in the office automation environment of local-area networks, involving word processing, electronic mail, telemetry, message switching and graphics.

- Networking exposes a more comprehensive, technical threat — communications. Controls need to be established for networks that utilize cable, fiber optics, CATV, microwave and satellite communications.

- Fewer people are required to run the micro, and this has resulted in some companies combining job responsibilities — effectively eliminating the separation of duties control mechanism.

- Auditors without sufficient DP background are being required by their companies or clients to become DP experts.

Good DP audit controls will take into consideration whatever controls are necessary to ensure the integrity of information. These controls include input, processing, output and operation controls in addition to security, personnel and disaster-preparedness considerations.



Insurance

A number of insurance companies are now offering specific policies for microcomputers. Firms that already have an existing policy for their mainframe operations may be automatically covered for any micros used in their business.

In general, microcomputer insurance policies cover the following:

- Direct physical loss or damage to your small computer system. Media, programs, data, documentation and source materials that are used to support the system are also covered.

- Accidental erasure or loss of data.


- Dishonest or fraudulent use of the computer system by your employees or outside parties.

- Unusual electrical damage caused by outside problems. These include spikes, brownouts or power surges that are not covered under normal maintenance contracts.

Extra expenses incurred to continue your business because of a covered loss.

Premiums vary from \$36 to \$175 per year for coverage ranging from less than \$2,000 to \$25,000, depending on the insurance company. Deductibles also vary between \$60 and \$250.

MCBA is looking for some professional bill collectors.



More specifically, we're looking for some dealers who like money. Lots of it. Because when you carry our powerful, field-proven software, that's exactly what you can expect.

Why? It's quite simple, really. The quality of MCBA's library of 17 modular manufacturing, distribution, and accounting packages is attested to by over 15,000 users worldwide. In fact, it's really the only serious software of its kind available for mini and micro environments. Thanks to its modularity and flexibility, not to mention its comprehensive documentation. All of which has helped us develop and maintain successful relationships with dealers like you for over 10 years now.

This means you can establish a relationship with us and have at your disposal a comprehensive library of software packages. All of which can be mixed or matched to suit the unique needs of your customers.

And as your customers grow, they'll come back to you for more business. Because you can expand their systems with totally integrated packages that work with each other like the movement in a Swiss watch.

So no matter what size your customers are now, or what size they are tomorrow, your business keeps growing. And the bills (the green kind) keep pouring in. It might even get embarrassing.

So if you're a dealer who's in it for the money, call MCBA now at (818) 957-2900. You may not end up being famous. But you could end up rich.

MCBA®

Software that grows on you. And with you.

2641 Honolulu Avenue, Monrovia, California 91020 For HP, Wang, DEC, and TI minis; and UNIX, RM/COS, and PC DOS-based micros. MCBA® is a registered trademark of MCBA, Inc.

Come see how to collect some cash at Comdex '84, booth #D514.

SECURITY Continued from 58/25

There has been little done in the area of securing the software and data stored on the stand-alone desktop microcomputer. Microbased data base security structures, which include authorization, departmentalization and compartmentalization schemes and are used in the mainframe and minicomputer data base environments, are nonexistent in the microcomputer environment.

The reason is primarily one of economics. It is difficult to justify the cost of the software and the system overhead required to run data base security software. Also, most micros are limited in the number of programs that can be run at the same time, unless multitasking/multiprogramming is featured. Companies that need to enhance data base security beyond the password stage have written their own custom software or have modified application packages. A way of controlling micro-based data is to assign responsibility for it to a specific individual.

In essence, that individual is

known as the owner of the data and has complete responsibility for its control, security and backup.

Such responsibility needs to identify what information is critical for its survival. This includes not only administrative, accounting and financial records, but also proprietary and trade-secret information. In order to determine what information is critical, ask the question, "Can my company adequately function if the micro-based information becomes unavailable for use?"

Maintaining copies of programs and data in any *DP* environment is of paramount importance. Microcomputer owners have been known to spend hours, even days, programming and testing applications only to have them destroyed in a fraction of a second when the third programmer

enters a wrong command, presses the wrong key or copies the wrong file.

It is equally important to keep a copy of the microcomputer's operating system software if copying is allowed by the vendor.

Copies of the operating system and application software should be kept in a secure off-site location as well as in a secure on-site location. In general, it is recommended that at least three copies, or generations, of files be kept — the son (current version of the file), the father (next oldest version) and the grandfather (oldest version).

Once the microcomputer is taken out of the realm of the stand-alone machine and integrated into a communications-based system, new threats and vulnerabilities surface that necessitate additional controls

and security. Communications network configurations link microcomputers, minicomputers and mainframe systems together. Many networks consist of these computers in addition to associated office equipment such as electronic mail, teleconferencing, videotex, video broadcasting, facsimile transmission, telemetry and word processing.

Microcomputers have invaded every part of modern business. With them they have brought all the headaches and problems that were relegated to their older and larger siblings — the miniframes and the mainframe. Security is just one part of the picture, but it is a part that has tended to be neglected, a dangerous tendency in today's information-dependent business environment.

HAZARDS Continued from 58/34

data. (Paper clips can assume magnetic qualities when stored in a magnetic holder.)

It is common for magnetic media to be placed on top of the radio or on the CRT terminal. Data problems can occur due to electromagnetic interference when the radio, CRT or micro is turned on and off.

Micro operators have depressed the wrong keys on the keyboard and have inadvertently erased or written over stored information.

The handy-dandy degausser (magnetic media eraser) has been used to erase the wrong diskettes or cassette.

Static electricity buildup has caused numerous problems.

Cassettes and diskettes are often stored on window ledges and in cars, places where rapid temperature variations and sunlight can cause warpage of the media and resultant read/write problems.

Incorrect external labels have been affixed to the cassette case or diskette jacket, resulting in lost files.

Gloss from certain types of labels has leaked through the protective diskette jacket, rendering the diskette and its data unusable.

Liquids have been spilled on the micro, resulting in short circuits, equipment damage and malfunctioning keyboards.

Fingerprints from direct contact with the magnetic media can cause read/write problems.

The electrochemical device in a telephone initiates a magnetic field when the telephone rings. This field can affect data if the magnetic media are placed directly against the telephone.

Ball-point pens and sharp pencils are commonly used to write file information on the external label while the label is on the diskette. The pressure of the writing can cause scratching or indentations on the magnetic media itself.

Power surges and drops are a common power problem.

Cassette tapes become unusable.

Diskettes make fine Frisbees; people have been known to "pass the data, please."

ONE LANGUAGE. ONE SOLUTION.

PC/FOCUS

PUT THE DATABASE POWER OF A MAINFRAME IN YOUR PC.

Now you can turn your Personal Computer into a mainframe-level applications development system with PC/FOCUS, the most powerful DBMS available for your PC.

As a tried-and-proven, user-friendly, 4th generation system, PC/FOCUS gives you the ability to query and report from files, build systems and manipulate data. It incorporates a relational database, screen manager & report writer, and offers dramatic abilities in graphics, financial modeling and statistical analysis.

But unlike older database technologies which require training and practice to master, PC/FOCUS uses simple English

statements you can learn in minutes! In fact, just a few moments of familiarization with Tabletalk™ is all that's needed for even a novice to become immediately productive.

Best of all, PC/FOCUS lets you download data extracted from mainframe files and DB's, then upload data and procedures from the PC to the mainframe for production execution. So your PC becomes almost as powerful as a mainframe, and you become almost as capable as a trained systems analyst.

Let PC/FOCUS with Tabletalk™ unlock the mainframe power hidden within your PC. For de-

tails, fill out and mail the coupon or write to Don Wassel, Dept. 58, Informatics® Builders, Inc., 1250 Broadway, New York, NY 10001.

Dear Don:
Yes! I'd like to unlock the mainframe hidden in my PC with PC/FOCUS. Mail full details to:

NAME _____
COMPANY _____
TITLE _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
TELEPHONE _____

INFORMATION BUILDERS, INC.

New York: (212) 736-9433 • Washington, D.C.: (703) 276-9054 • St. Louis: (314) 454-7200 • Chicago: (312) 799-0515
Dallas: (214) 659-9970 • Palo Alto: (415) 326-9061 • Los Angeles: (213) 445-0726 • Houston: (713) 952-6360

Dealer inquiries invited.

[illegible]

THE UNITED STATES OF AMERICA
DEPARTMENT OF THE ARMY

Form No. 100-10 (Rev. 1-1-60)

1. Name (Last, First, Middle Initial)
2. Grade or Rate
3. Component
4. Organization
5. Position
6. Duty Station
7. Date of Birth
8. Date of Entry into Service
9. Date of Discharge
10. Date of Death
11. Date of Retirement
12. Date of Separation
13. Date of Reentry into Service
14. Date of Reentry into Component
15. Date of Reentry into Organization
16. Date of Reentry into Position
17. Date of Reentry into Duty Station
18. Date of Reentry into Service
19. Date of Reentry into Component
20. Date of Reentry into Organization
21. Date of Reentry into Position
22. Date of Reentry into Duty Station
23. Date of Reentry into Service
24. Date of Reentry into Component
25. Date of Reentry into Organization
26. Date of Reentry into Position
27. Date of Reentry into Duty Station
28. Date of Reentry into Service
29. Date of Reentry into Component
30. Date of Reentry into Organization
31. Date of Reentry into Position
32. Date of Reentry into Duty Station
33. Date of Reentry into Service
34. Date of Reentry into Component
35. Date of Reentry into Organization
36. Date of Reentry into Position
37. Date of Reentry into Duty Station
38. Date of Reentry into Service
39. Date of Reentry into Component
40. Date of Reentry into Organization
41. Date of Reentry into Position
42. Date of Reentry into Duty Station
43. Date of Reentry into Service
44. Date of Reentry into Component
45. Date of Reentry into Organization
46. Date of Reentry into Position
47. Date of Reentry into Duty Station
48. Date of Reentry into Service
49. Date of Reentry into Component
50. Date of Reentry into Organization
51. Date of Reentry into Position
52. Date of Reentry into Duty Station
53. Date of Reentry into Service
54. Date of Reentry into Component
55. Date of Reentry into Organization
56. Date of Reentry into Position
57. Date of Reentry into Duty Station
58. Date of Reentry into Service
59. Date of Reentry into Component
60. Date of Reentry into Organization
61. Date of Reentry into Position
62. Date of Reentry into Duty Station
63. Date of Reentry into Service
64. Date of Reentry into Component
65. Date of Reentry into Organization
66. Date of Reentry into Position
67. Date of Reentry into Duty Station
68. Date of Reentry into Service
69. Date of Reentry into Component
70. Date of Reentry into Organization
71. Date of Reentry into Position
72. Date of Reentry into Duty Station
73. Date of Reentry into Service
74. Date of Reentry into Component
75. Date of Reentry into Organization
76. Date of Reentry into Position
77. Date of Reentry into Duty Station
78. Date of Reentry into Service
79. Date of Reentry into Component
80. Date of Reentry into Organization
81. Date of Reentry into Position
82. Date of Reentry into Duty Station
83. Date of Reentry into Service
84. Date of Reentry into Component
85. Date of Reentry into Organization
86. Date of Reentry into Position
87. Date of Reentry into Duty Station
88. Date of Reentry into Service
89. Date of Reentry into Component
90. Date of Reentry into Organization
91. Date of Reentry into Position
92. Date of Reentry into Duty Station
93. Date of Reentry into Service
94. Date of Reentry into Component
95. Date of Reentry into Organization
96. Date of Reentry into Position
97. Date of Reentry into Duty Station
98. Date of Reentry into Service
99. Date of Reentry into Component
100. Date of Reentry into Organization

The Solution for Your Information Center

UNITED STATES DEPARTMENT OF AGRICULTURE		BUREAU OF PLANT INDUSTRY		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION		PLANT INDUSTRY DIVISION			
---	--	--------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	-------------------------	--	--	--

- ☐ I want to learn more. Send me The SAS Solution packet.
☐ Have a sales representative call me today!

Please write your name and address below, or attach your business card.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ ZIP _____

Hardware _____

Operating System _____

Telephone # () _____

SAS

Cable-connected micros come to the rescue

By Steven Adkins
Special to CWR

A new class of cable-connected microcomputers has given corporate DP managers a way to solve problems posed by between-the-systems. These connected micros are communications, shared-resource installations with 16 to 64 users, located, for example, at branch offices or across-the-country manufacturing facilities.

The conventional DP solution — a time-shared computer with a low-cost terminal on each user's desk — starts to degrade when the system expands beyond a handful of users. Degradation is even more likely

when several of the terminals are simultaneously inputting high volumes of data. High-volume word and transaction processing can quickly preempt a host computer's attention and resources.

Linked personal computers or a network of dedicated workstations would generally protect users from such disruptions. But this type of solution would also commit the corporate DP manager to costly, sophisticated personal computer facilities at each user location, whether they are needed or not. A few personal computers might be tolerable and justifiable, but not dozens of units, each

running uncontrolled software and accessing separate data bases.

Cable computers provide a third alternative. They are, literally, in-between computers, with enough local processing power and memory to give each user the sense of a dedicated workstation — independent of any other user's activities — yet equally capable of serving as dumb terminals for such conventional time-sharing applications as intermittent data base inquiry and responses.

Cable computers are microprocessor-based units with their own local memory and operating system software, connected by high-speed coax-

ial cable to a cable-system host for such shared resources as disk storage, data communications facilities and hard-copy printers.

In one mode, the cable computer can be used as a dumb terminal, totally dependent on the cable host for both data and application programming. Such applications would include a full complement of commercially available and in-house-developed applications.

In a second mode, commands would order the host computer to download a complete application, such as a word processing software package, to the cable microcomputer. The cable computer then becomes, in effect, a dedicated, high-performance word processor, under complete control of the user.

Additional commands would convert the cable computer to a third mode: a true desktop computer with its own operating system and user-selected application programs. The host computer would download a complete copy of a microcomputer operating system — permitting the user to execute any of the thousands of applications written for standard system software.

User advantages

Then, every user has the advantage of a single, universal user interface, adaptable to both simple and complex tasks without any retraining or readjustment to an unfamiliar keyboard or screen arrangement.

The cable-system host that supports all of these cable-computer functions is itself typically a multi-processor unit with distributed internal intelligence.

Control to the host's operation are a high-performance microprocessor and multimegabyte of main memory. Equally important, however, are smaller microprocessors that relieve the main processor of the constant interruptions that characterize a multitask system with centralized disk storage.

Smaller distributed intelligence would speed throughput on the cable network and relieve the host of cable housekeeping chores when a cable computer or terminal needs servicing.

Coupled with the multiprocessor design, the cable-system host computer requires an operating system that takes full advantage of the distributed intelligence of the cable system itself. By definition, the cable-system host operating system is multitasker and multitasking. The operating system of the cable host must support a variety of programming languages, such as Basic and Cobol, allowing different applications using different languages.

Taken together, cable-computer hardware and software offer the corporate DP manager an important alternative for difficult, between-site installations: a flexible, powerful, economical system that can be expanded without degradation in performance, yet can be tailored to the exact needs of diverse users without excessive processing capabilities for the tasks to be performed.

Adkins is vice-president of engineering at Partec Computer Corp., an Irvine, Calif.-based vendor of cable computer systems.



CIES 680[™] Business Computers

END THE WAITING GAME

Buying a business computer can be a real Catch 22.

Companies get one to save time. Then, they can waste all kinds of time just getting it to work. The software isn't quite right, or much worse, isn't even ready.

But there is no catch with a CIES 680 Business Computer System. The software is right. And from day one, you have applications ready to run.

The pre-written applications include a complete general accounting package. A word processing system, as easy to

learn and use as any you'll find. A ready-to-run financial worksheet. And more.

Instant solutions. No waiting. And even if a customer needs one of our pre-written applications modified or a whole new application written from scratch, you can do it in practically no time.

With PRO-IV,[™] the unique applications processor for the CIES 680, you can customize applications in *one-tenth* the time it takes using conventional methods. Or modify an existing application in *one-hundredth* the time it normally takes.

Just as important, a CIES 680 is a true, multi-user system with power to spare. It expands as information processing needs expand.

With its 32/16-bit micro-

processor power and 256K to one Mbyte memory, a CIES 680 can support from one to 20 users.

So, why not end the waiting game for your customers. Become a CIE Systems dealer and sell the CIES 680s that are ready to do business now.

Write or call CIE Systems, Inc., 2515 McCabe Way, Irvine, CA 92713-6579 (714) 650-1800. Or call toll free 1-800-437-2341. In California, call 1-800-458-6273.



CIE SYSTEMS
A CORP. ELECTRONICS COMPANY

THE CIES 680 is a trademark of CIE Systems, Inc.
PRO-IV is a trademark of Data Systems Resources, Inc.

© CIE SYSTEMS, INC. 1983

***"IDMS/R is the perfect DBMS
for the IBM 4300 user."***

Frank Chisholm*

Because IDMS/R, with its Automatic System Facility, makes your IBM 4300 as easy to use as a personal computer.

The Automatic System Facility (ASF) is so comprehensive and easy to use that all an IBM 4300 user need do to develop an application is to define a relational record. ASF then dynamically generates all necessary supporting structures including data definitions, screen formats, application processing logic, and documentation. In other words, the developer can witness the application being produced, literally, in seconds. This is an analog to ASF's ability to generate fourth generation languages. Thus IDMS/R is the perfect system for the IBM 4300 user with limited staff resources.

But suppose when you build a complex, high volume production application with IDMS/R, you desire outstanding performance. Typically, 5% of the data relationships (joins) in any application are accessed 95% of the time. With IDMS/R you can simply change these relationships to predefined joins and benefit from a dramatic boost in performance.

We call it Relational Fastpath. This is what makes IDMS/R a unique relational DBMS, and a perfect system with which to build production applications. In addition, IDMS/R has the most sophisticated back-up and recovery capability of any DBMS, a full integration with personal computers and a complete line of integrated financial and manufacturing applications.

In summary, IDMS/R was designed to satisfy the requirements of the IBM 4300 user who wants to develop both production and end user applications faster and easier.

For further information, attend a Cullinet Seminar. Mail the attached coupon or call Cullinet at 1-800-225-9830 (in Massachusetts 617-329-7700).

IDMS/R Seminar Cities and Dates

[illegible]

I'd like to attend your seminar on _____ in _____.

Computer _____ (Name) _____ (Title) _____
 Name/Title _____
 Name/Title _____
 Company/Department _____
 Address _____
 City _____ State _____ Zip _____
 Phone (____) _____
 Mail to: Collett Software, Inc., 403 Blue Hill Drive,
 Boston, MA 08106-2196 ATTN: Corporate Marketing
 Collett Software products are designed to run on IBM 386/486 PCs.

Database: Cullinet

© 1994 Cullinet Software, Inc. 400 Blue Hill Drive, Watwood, MA 02090-2200

Micro's future read in mainframe past

By Michael Dowling
Special to CWS

As the market for integrated software for microcomputers continues to expand, it becomes a case of: "The more things change, the more they stay the same." There are trends previously established in the mainframe arena that point to issues that microcomputers and software for micros will address.

During the rise of the mainframe computer, software's role was not seen as a crucial one. Instead, data processing departments used and maintained programs that had little planning beyond their intended function. These in-house programs were costly to develop and costly to maintain.

In the late '50s and '60s, the computer software industry met a growing demand to provide packaged software developed to meet the needs of many different organizations. Later, these same vendors improved these packages, integrating them so they could communicate with each other.

History repeats itself

In the microcomputer segment, history is repeating itself. Perhaps the only difference is the increased emphasis by the software industry on "user-friendliness" — allowing users to perform functions with simple keystrokes and reducing the time required to learn how to use the software.

At present, the personal computer has been targeted for the middle manager, one whose job is to produce a thought product or decision. Since the overwhelming majority of these users had neither the background nor the interest in formal program development, the packaged software market for personal computers was a great success.

However, as more and more packages became available, personal computer users encountered the same dilemma as their mainframe predecessors — they had different packages performing separate functions that could not communicate with each other, and each of these packages required access to the same data.

The software industry responded in two ways to this problem. Some companies developed software packages incorporating a spreadsheet with a graphics tool or other functions. These packages pointed developers in the right direction — personal computer users wanted integration of a variety of tools.

A new problem arose, which was twofold: The personal computer user lacked direct access to mainframe data, and when he finally had the data manually keyed in for one application, he would have to rekey it for use with any other program. Shortly afterward, other software developers began addressing the data access issue. The so-called micro-to-mainframe link was being attacked by these mainframe software firms, each employing a different approach.

As the link is introduced to the market, firms have introduced second-generation personal computer software packages that bring greater power and flexibility into the hands of the personal computer user. Products such as these have improved the

personal computer users' ability to access, manipulate and transmit data, in much the same manner as their forerunners in the mainframe software arena had done previously.

There are a few different areas that microcomputer software developers might explore in the future. Perhaps the most important development would be improved software to capitalize on the faster 32-bit microprocessor. This would allow an important change in processing to take place. It would allow the personal computer to take its place as an end-user processor, handling more of the work currently performed on the

mainframe at the local level.

As micro software continues to grow in importance, it becomes clear that users, and large-volume corporate users in particular, need products on which they can standardize. Commonality will allow increased sharing across the corporation. Good microcomputer software should provide a foundation for growth, allowing for the inevitable improvements that technology brings. Another important feature for corporate users is to allow access to corporate data, permitting both downloading and uploading as well as updating of selected production files. This is a cru-

cial need for personal computer users, and a product that meets that need will open up a great deal of opportunities when implemented in combination with these other future developments.

The issues in microcomputer software are quite similar to the ones addressed in mainframe software. As integration has risen to play a key role in micro software, we can look forward to other upgrades and improvements in these areas.

Dowling is a public relations coordinator with Caldwel Software, Inc., a software firm based in Westwood, Mass.

Computer
training
our way,
your way,
or buy
the book.

Insurer secures productivity with micro plan

Three-part program spanning 18 months results in active user community

NEW YORK — Like most companies in the last two years, Home Life Insurance Co. recognized the productivity potential for microcomputers in its home office environment. Through a three-part microcomputer plan spanning 18 months, Home Life achieved an active and healthy user community, with results exceeding initial expectations.

"Even in 1982, we saw what was happening in companies that were not controlling the micro invasion — total confusion and lack of productivity," stated Warren Reynolds, se-

nior vice-president of information services at Home Life. "From the start, we felt the best solution was central leadership regarding the hardware and software that Home Life would use and how we would bring the technology into the company. We developed a detailed microcomputer plan and presented it to senior company management. They identified the responsibilities of all involved. After receiving their support for what we wanted to do, we were on our way."

Doug Keyes, systems vice-president of information services, expressed similar feelings. "Our objective was to provide microcomputer synergy through a team effort between information services and the user departments, with information services as the focal point."

Before any detailed structure was announced, the first stage of the plan included a wait-and-see period, where, based on certain pilot projects including the use of single micros in selected departments, needs could be

better evaluated and a corresponding strategy implemented.

In its final draft, the microcomputer plan consisted of the following phases:

■ Phase 1 — Creating micro awareness and gaining top management support.

■ Phase 2 — Formal training and clear user support.

■ Phase 3 — User synergy and involvement.

According to Gerald Rabli, a senior systems analyst at Home Life who was instrumental in implementing the plan, "Our goals for the first stage were threefold: First, to expose employees on many levels from all departments to the features of the IBM Personal Computer, while at the same time announcing information services' commitment to support the micro; second, to evaluate the level of training needed to provide the user with software self-sufficiency skills; third, to collect data through pilot projects and an experimental microcomputer lab in order to plan strategy."

See PLAN 35/44

The only thing as complicated as deciding on a microcomputer is figuring out how to use it. But that's getting easier and easier all the time. Thanks to NTS.

National Training Systems has been making executives, managers and professionals more productive since 1974. We work with some of the largest international corporations. At our place or theirs. Here's how:

Our way:

NTS offers one- and two-day workshops that introduce the microcomputer, teach an integrated software package that supports the user's goals, and provide actual hands-on training.

In our one-day workshop, you'll learn to choose hardware and software appropriate for your needs. In the two-day workshop, you'll use integrated software, such as Lotus 1-2-3™ and its successors. We'll also teach you how to use electronic spreadsheets, graphics, data communications and database functions to solve business problems.

One-Day Workshop Micro Ease™

- What is a personal computer?
- How a personal computer can help you.
- How to operate a personal computer.
- How to use a personal computer for word processing, electronic spreadsheets, graphics and database functions.

Two-Day Workshop Executive Personal Computing Workshop

- How a personal computer and application software can help you.
- Intensive "hands-on" training that shows users to immediately apply what they've learned.
- Emphasis on learning a wide range of decision support functions.
- Fun, interesting business "games" to refine and apply computer skills.

Your way:

Since 1974 we've developed customized training programs for companies such as United Technologies Corporation, IBM, Hewlett-Packard, Xerox and Burroughs.

We train at your place of business. Using our instructors or yours. We focus on the hardware and software that best suit your specific needs.

You'll overcome your fear of computers. You'll dramatically increase productivity. And if you're not careful, you might even enjoy it.

Or buy the book:

"Putting 1-2-3 To Work" is a hands-on self-study course that teaches the popular Lotus 1-2-3 software at your own pace and your own place.

Using Lotus, you'll learn to create "what-if" models, graphics, databases and spreadsheets in an easy-to-use, time-efficient manner.



You're given a handbook, practice data diskette, eight application templates, and performance aids. All designed from ten years of NTS training experience.

Send us the coupon, or call the number below, and we'll give you more information. About our own workshops, customized training, or the self-study course. The three smartest computer programs you can buy.

Lotus and 1-2-3 are trademarks of Lotus Development Corporation.

Micro Ease is a trademark of NTS.

Tell me more:

- Please call me with more information for the following workshops or customized training:
 - Micro Ease™ One-Day Workshop
 - Executive Personal Computing Workshop
 - Customized Training
- Please send me _____ copies of the "Putting 1-2-3 To Work" self-study course: \$95 each + \$3 each for shipping and handling. (California residents add 6-1/2% sales tax.)
- My check or money order for \$_____ is enclosed.
- Please charge my credit card:

VISA/MC # _____

Exp. Date _____

Signature _____

Name _____

Title _____

Company _____

Phone (____) _____

Address _____

City _____

State _____

Zip _____

For information, call collect: (213) 394-7645.

(For our New York office, call collect: (212) 869-1730.)

COB

IBM NATIONAL TRAINING SYSTEMS, INC.

Los Angeles New York London

221 Broadway, Suite 2000, CA 90048 • 280 Park Avenue, Suite 2400, New York, NY 10022

Strategic advice for getting to phase 1

Gerald Rabli, senior systems analyst at Home Life, suggested that if the present state of corporate microcomputer strategy has somewhere between nothing and Phase 1, then the following approach might be helpful:

■ Obtain top management support. It's an old phrase, but very pertinent here. Management is the most influential group in your company, and it probably knows the least about the capabilities of the microcomputer. Offer to educate managers with morning overview sessions or, if necessary, individual sessions. This will give you the opportunity to state your case for proper microcomputer use in their respective departments.

■ Designate an area for a Personal Computer Center and supportive. Like a shopping center that provides many services in one location, people need an area in a company where they can go with their hardware, software and application questions.

■ Train the right way. Holding a user's hand during the first three hours he is using a micro never helped anyone. Obtain answers to important questions like: What courses should we offer? Who should assist? How can we check if the training is effective? When will we know to discontinue the effort?

■ Last but not least, find knowledgeable and enthusiastic people to implement your plan. Without personnel who can learn, analyze and promote the use of information systems, the micro invasion in your company will be lost to the enemy — namely, nonproductivity.

SPECIAL REPORT

PLAN

Sum SR/43

By for the next phase."

Several implementation activities occurred concurrently. A microcomputer lab was established to allow anyone to experiment with a particular package. A series of presentations was made to all departments in the company, announcing microcomputer support as a new service provided by information services.

Follow-up presentations were then made which addressed a particular software package — again for anyone interested. With exposure as the primary goal of these sessions, no hands-on activities were provided. All of those interested in knowing more were encouraged to use the tutorial documentation located in the microcomputer lab's software manuals.

If nothing else, these actions assigned the responsibility for company-wide compatibility and support to one department, thus discouraging departments from doing their own thing. In addition, this stage produced findings that shaped the strategy for the next phase.

Realizations

Among the major realizations were:

- The inability of users to go it alone with the documentation that accompanied the software.

- The need to establish guidelines and procedures, outlining proper and improper employee use of the microcomputer as well as the assumed responsibilities of information services and the user.

- The need to support one software package from each of a limited number of generic categories, thus creating a user community to share similar experiences.

- The need to have a user's first experience with a package be a positive one by providing classroom training to key individuals in various departments.

- To make the support more attractive to the user, information services initially would not charge departments for training attendees and application analysis.

- Top management must be included as one of the target groups for creating awareness.

With this information, an aggressive training and support program was initiated.

Commercial packages were chosen as supported software according to their user-friendly nature in an effort to discourage programming in lower level languages. As a group, the chosen packages satisfied the intended microcomputer activities for the users. Included were training courses averaging 10 hours per subject, as well as support regarding hardware maintenance and application design. A Personal Computer Center was created at Home Life to provide these capabilities and to perform the hardware acquisition.

The curriculum for each training course was developed and taught by in-house staff. A maximum of 10 people attended each course, working two to a micro. The course content included lectures, hands-on class exercises and work sheets.

One week following the training, each attendee was asked to return alone with some application of his own that need the software. This allowed the training staff to evaluate the skill of the attendee and the ef-

fectiveness of the course. The private consultation ensured that the user's first experience with the software would end on a positive note, and it initiated a personal relationship between the trainer and the user, one that would be developed over time when additional applications arose.

Many felt that this was the single most important ingredient toward the project's success.

"Our people were able to learn not only what was correct and incorrect, but also what was essential and nonessential for using a software package," stated Linda Bonoreale, a financial analyst in the controller's office and one of the first managers to experiment with the microcomputer.

Handling Personal Computer Center traffic turned out to be the big-

gest problem. "One of the consequences of good training is that people want more of the same," stated Dennis Murphy, director of training and standards.

Home Life's solution was a shift in emphasis from classroom training — aimed at getting the individual user started — to coordinating and creating activities that would provide more user involvement in the education process. After almost 20% of the home office was accommodated with the classroom training, it was time to cash in on that manpower investment.

First, users group meetings were created for each of the supported packages, making the groups small enough for an attendee to contribute freely.

The second vehicle created was a newsletter with a present circulation of more than 800. Here, the Personal Computer Center could mix education with entertainment and publish user-submitted success or disaster stories.

On-disk tutorial packages were adopted in place of classroom training, thus relieving some of the demand on the Personal Computer Center staff's time.

Although this phase has only been in effect since the beginning of this year, feedback has been positive. "In the past, some people would attend a training session because they had the time, but were without a useful application," Murphy said. "Now, with the tutorial software, people can learn to use a package when they have both."

Give your PC

the edge the new

3Com

and most compatibles, such as COMPAQ, TANDY and Eagle.

So find out how easy it is to get into personal networking. Send in the coupon and a check for \$49.95 — that's \$49 off the usual \$99 price. Or just check the box for complete information on how to do your personal best.

3Com

Personal Computing

3Com Corporation
10000 Wilshire Blvd., Suite 1000
Beverly Hills, CA 90212
(800) 352-3333

Broadcasting system tunes in multiuser micro

CRITIAL CITY, Va. — As many as seven users of the same system in the Engineering Department of the Mutual Broadcasting System (MBS) are running sophisticated antenna coverage programs, writing letters and memos, developing programs such as one to predict sun outages and manipulating departmental budget projections in "what-if" scenarios.

The Compugro Corp. System 814/C multiuser microcomputer that MBS chose is used exclusively in the MBS Engineering Department and provides computational capabilities independent of the many computers in

place in other areas at MBS, according to Lynn Ashley, design engineering manager in charge of the computer system at MBS headquarters here.

The machine partitions its memory to each user, allowing each one to run a program in memory entirely independent of the others. Each user appears to have his own computer when executing programs that are contained entirely in the machine's random-access memory (RAM). However, when there are simultaneous calls on the I/O part of the system — disk storage access, for instance — there may be some degradation in speed.

Dave Wilcox, operations support manager, is primarily a user of programs developed under Ashton-Tute's Dbase II data base management system. Wilcox is involved with the network's Multicom system, a one-way subscriber delivery system for voice and data aimed at relatively large organizations with a need to communicate on a one-way basis to a large field organization.

An example of such a company might be one of the large home products companies whose wares are sold on a part- or full-time basis by individual distributors and sales people. Data delivered over Multicom to

them and users could include price changes, promotional information, newsletters, new product information and similar one-way, headquarters-to-user kinds of information. MBS is planning to lease the rights to carriers from about 200 FM radio stations.

Integrates research material

Wilcox uses the Compugro system to integrate research material concerning the satellite communications areas needed for the Multicom network.

This research encompasses searching the data base of FM stations compiled by the Federal Communications Commission and developing a list of those stations that will have the coverage needed to make the Multicom system effective. Further research is conducted through questionnaires and is developed into detailed coverage of each station. A final list of stations with desirable satellite communications areas is then compiled for integration in the network.

The search through the files compiled by the FCC is conducted with a computer program developed by Wilcox and a coverage program written by Ashley. The process evaluates the 11,000 records in the FCC list, covering about 4,000 stations for such factors as station identification call letters, frequency, longitude and latitude of transmitter, effective radiated power and antenna height above average terrain.

In less than 20 minutes, the Compugro microcomputer can produce a rough picture of the coverage that might be expected from each station in a particular metropolitan market.

Coverage pattern

When this data is combined with information contained in a terrain data base, the end result is a coverage pattern that pinpoints specific stations that will give Multicom full coverage in the most economical fashion. This final use in developing the selection process includes output from a hard-copy plotter as well as a visual display, along with a "what-if" program to allow MBS to test various combinations of transmitters in each market. These programs were written in Microsoft, Inc.'s Basic.

Andrew Colle, a senior programmer who did much of the development work on MBS' satellite-related software, was also deeply involved in developing Multicom software. He used the Compugro computer to develop a program that integrates the terrain data base information with other available information to develop the Multicom scenario.

Others in the firm's Engineering Department are developing special software to be used for hardware design engineering.

In general, few software tools have been developed that meet MBS' special needs. Further, what is available is considered to be very expensive and would require extensive modification after purchase. "With the capability of the Compugro System 814/C to develop programs as well as run them, we feel that we'll be far ahead in the long run by writing our own design software," Ashley

See SEMINAR/84 83/45

- ☐ Yes, I'd like to know more about personal networking. Send me your freeGuide sender details (enclosed is my SASE).
- ☐ Just send me more information, I'll let you know later if I want the details.

Name _____

Designation _____

Address _____

City/State/Zip _____

Send to: Kross Corporation, 1285 Shreveport Way

101, Box 7700, Alameda, CA 94601, Attn: Cindy Rando.

(415) 941-8882

OW 48024

SPECIAL REPORT

BROADCAST from SR/45

ley said.

Peter Nielsen, manager of MBS Satellite Uplink Facility, uses the Compuserp to adapt a program that will predict sun outages that affect transmissions from the broadcasting satellite serving MBS from about 23,000 miles in space.

A sun outage approximately three to 15 minutes long occurs twice a year, when the sun is directly behind the satellite. During this period of time, the sun's radio noise blocks transmission from the satellite. An example of the types of problems that can be caused by this phenomenon was an instance last fall when a sun outage blocked MBS' broadcast of a National Football League game. By predicting the exact time and lo-

cation of the area the outage will affect within the MBS broadcast area, provisions can be made to deliver the signal via ground lines to the affected areas during the blocked period, as was done during the football season.

The program Nielsen is developing, which will run on the Compuserp, predicts where and when the outage will occur, which specific network affiliates will be affected and at precisely what time and for how long the outages will take place. A letter is then automatically sent to the affiliate, warning it of the precise times when degradation of the satellite signal can be expected and the alternative steps that can be taken to remedy it. The program previously had been run on a large time-sharing minicomputer.

Gene Swanney, senior vice-president of MBS' Broadcast and Communications Service, uses the system primarily for report generation. Swanney uses Sorcim Corp.'s Supercalc in developing overall financial plans for the department.

Mighty confidentiality

"Some of what Gene does is obviously highly confidential in nature," Ashley said. "The security of having documents under his control on a departmental computer, protected by a password and not floating around in the typing pool, is very appealing to him. Like so many of us, he can compose faster at the keyboard than he can in longhand, which means that reaching a final output report is speeded considerably."

One of the major side benefits of

the system, according to Ashley, is its ability to handle out-of-office and administrative tasks as well as high-speed number-crunching computations. The Engineering Department has found great time savings in producing virtually all internal correspondence on the System 816/C, bypassing an administrative typing pool that operates a stand-alone word processing system. "By the time you compose a memo in long-hand and enter it in the typing pool, you can write it at your terminal, print it out and have it delivered," Ashley said.

Also, all the CRT terminals in the Engineering Department are linked together through the Compuserp, and messages can be interchanged or left on other terminals in the network through use of Mail and Write programs furnished by Oxford Computer Systems of San Leandro, Calif., the original supplier of the system.

Another administrative use for the Compuserp is in tracking purchase orders. "We are developing a purchase order tracking system within Engineering to simplify keeping tabs on the large quantities of hardware that are regularly purchased by our network. We realized that we needed day-by-day information on what we were spending, on a project-by-project basis. This was a need the Accounting Department could not fulfill on its IBM System/38 computer, but which we, with our multiterminal micro, could take on without too much trouble," Ashley said.

Again, the Phase II data base manager was used to form a structure for such a program. Report forms were generated, and tracking of purchase orders now is being handled within the Engineering Department and coordinated with the Accounting Department.

Still another administrative use for the System 816/C within the Engineering Department is as a direct interface to the MBS telex system for outgoing messages. By using a modem, the Engineering Department can send messages via the telex network. One example of this was sending a parts list to a series of vendors seeking competitive bids. The list was generated in the department using the Micropro International Corp. Wordstar word processing program, converted to a file suitable for telephone transmission and sent directly over the telex lines to selected vendors, thus removing time and administrative overhead from the bid process.

The system is configured with 1M bytes of main memory plus Compuserp's proprietary M Drive. It is the M Drive, according to Ashley, that makes the word processor software so efficient.

The system uses Digital Research, Inc.'s MP/M 6-16, a multitasking operating system based on the same firm's CP/M. Using a standard operating system such as this means that literally thousands of proven third-party programs, languages and utilities are available to the MBS Engineering Department, which might not be the case with a machine-specific operating system.

Output from the Compuserp goes to its terminals and storage devices such as hard disk and floppy disk drives, as well as to a letter-quality printer for external documents, two high-speed dot matrix printers for internal documents and memos, a hard-copy plotter and a graphics device.

UNINET. JUST TO PROVE WE GIVE YOU SERVICE ANY TIME YOU NEED IT, CALL THIS NUMBER AT 3 A.M. TOMORROW.



Having a toll-free number may not be unique, but having a service specialist there to answer it 24 hours a day certainly is.

You can call us with any question or any problem, at any time.

We believe that service, both before and after you select an information network, is the key difference between UNINET and every other data communications network.

At all of our major sites you'll find a UNINET Systems Engineer on hand to personally implement your network services.

You'll have on-going technical support from people who have first hand knowledge of your particular equipment and communications needs.

And you'll always have a toll-free number available for immediate assistance.

We're UNINET. The information network that never sleeps. Find out more about the nation's first large value-added network. Call us today at 1-800-642-9508.

The best kept secret in value-added networks.

UNINET, Inc.

2000 Oakway
Baltimore, Lemma, MD 21226

1-800-821-5340

There are no boundaries. Birds have to migrate, and we're remarkably similar to the freedom they have with software for the System 8000.



Mainframe conversion leads firm to micro link

ATLANTA — A costly mainframe conversion at an insurance group located here was the impetus behind the purchase of a micro-to-mainframe link package.

The conversion from a Burroughs Corp. B6000 to an IBM 4341 entailed an extended development cycle, which led Matt Buckman, vice-president of MIS at Alexander Howden Group U.S., Inc. to consider the use of microcomputers.

Charles Morris, vice-president of research and development at Computer Network Research, Inc. (CNR), who was employed as a consultant to Alexander Howden at the time, saw an opportunity to use micros to continue development for the insurance company. Although the firm's mainframe resources were tied up in changing computer environments, programs were still needed to complete the conversion.

On Morris' advice, Alexander Howden adopted the Baseline micro-mainframe link. Developed by CNR, Baseline links an IBM Personal Computer to an IBM mainframe, allowing a user to upload, download or extract selectively data from mainframe Vsam files.

"The product provides a comprehensive data management system that minimizes the difficulties normally encountered in the development of microcomputer applications and further provides an easily used interface with popular spreadsheets and transfer of data to and from the mainframe," Buckman said.

Two projects

In the beginning, two projects were accomplished. The first, a project control system, was developed to allow Buckman to manage people and resources. In addition to tracking both hardware and software inventory associated with the conversion. Using Baseline, he was able to capture, extract and sort inventory information by model, by vendor or by location.

The second project was a major systems change for year-end reports, which were taking two to three weeks to process on the mainframe. The company also wanted to perform the report function on a quarterly basis.

In this user-developed system, using the personal computer, Buckman was able to bring together the report for both quarterly and yearly periods in two days. "Using a personal computer and Baseline," Buckman said, "we developed a very elaborate, very sophisticated insurance brokerage system in less time than we anticipated."

Baseline provides a simultaneous interface with the mainframe, giving the capability to migrate files from the personal computer to the mainframe.

"In the past," Buckman explained, "many things that needed to be done could not be justified for mainframe

use. Personal computers offer an economic alternative, not only in labor cost savings but in accuracy of data."

Buckman, who has to consider the drain on DP staff and computer time that a project will require, now can solve the problem: first on a personal computer. This by-

passes DP staff and saves the mainframe for storage.

This has led to the implementation of an information center. One division of the company, with user areas throughout the Southeast, is supported totally from a central mainframe. Howden uses Baseline to download the re-

mote computer's master file, allowing the user at that site to inquire solely into the remote computer's files and to transmit less frequently than he did previously. The company can go from an all-day use of a dial-up line, every day, to a once-weekly transmission of information.



Info resource management aids data security

Determines what needs protection from hackers, in-house breaches

By **Howe Liggett**
Special to CWS

Assuming that only mainframe systems are vulnerable to illegal access, theft and sabotage is a little like thinking that all stolen cars are limousines. While the main-

frame has more storage capacity, its data is not necessarily more valuable than information processed in microcomputers — especially to the company that owns that information.

But just as a stolen Mer-

cedes will always get more attention than a missing Volkswagen Bug, so will the business community and the media tend to pay more attention to mainframe security breaches than to identical events in micros.

In order to keep this issue in perspective, we have to understand that some people in specific circumstances will find breaching into a mainframe more desirable — either for monetary gain or for a challenge. But we all know

that people who want to access micros for theft or sabotage will do so. Chances are we just won't hear about them as often.

We also need to consider the danger of outside hackers. While we might assume that hackers deliberately set out to access only major data banks (banks and government agencies), this year's most notable hacker admitted it is not that simple.

Neal Patrick, a member of the "414 Gang," was caught by the Federal Bureau of Investigation in the summer of 1983 for allegedly accessing over 50 private computer systems illegally. During a wave of publicity that put his picture on the cover of *Newsweek* magazine, the 17-year-old appeared on the Phil Donahue show. During questioning, Patrick admitted a startling fact: When randomly dialing into computer systems, the size and identity of the system are not initially apparent. Patrick claimed that he and his group "didn't know which computer we were accessing" until they were deep into the system. In other words, the outsider cannot tell if he is getting into a micro or a mainframe.

Telecommuting, fragmentation

Undeniably, the use of and dependence on micros have skyrocketed in a more dramatic way than the use of mainframes. Two phenomena can be enlisted to explain this surge and its subsequent effect on security: more people working at home and a rise in small businesses' use of computers.

Both of these examples are a direct result of the increasing use of telecommunications, a technology now shared by corporate giants, small companies and individuals alike.

As more jobs relate to information processing, many people are choosing to work at home. A new "buzzword" has been invented to cover this issue: telecommuting. While offering advantages in employee morale and corporate overhead, these employees and the telephone lines that connect their home computers to a corporate host can pose serious security risks to the firm — risks that are identical whether the corporate host is another micro or a mainframe.

In the small business arena, see EW 5/30

Liggett is a security applications researcher at Los-mak Telecom, Inc., a San Francisco-based vendor of communications security devices.



SPECIAL REPORT



INFO from SR/49

na, retail franchises are an example of micros directly linked by dial-up lines. While most franchises are separate profit and loss centers, they will need to trade data with headquarters regarding inventory, pricing, payroll and so forth. While these franchises do not individually resemble corporate empires, the amount and value of the data they exchange with a host via linked micros can be considerable.

Often in a franchise arrangement the host will poll all remotes during off hours to gather information on daily financial records and inventory requirements. This constant dialogue between the host and remotes is vulnerable to unauthorized access, whether the host is a mainframe or

another micro.

Since mainframes and micros are equally vulnerable to security breaches, how can illegal access be prevented? Obviously by installing security systems. But until there is an understanding of how valuable the data is, chances are good that the most effective security solutions will not be implemented.

A management approach known as information resource management (IRM) attempts to address this issue. IRM is based on the premise that data is a resource to be managed and protected like any other corporate resource. Therefore, all vulnerabilities of that data must be scrutinized and corrected to maintain the integrity of the computer system.

The first step in IRM is to define the data. This is done by establishing

a data dictionary that says, in effect, that within the computer system applies will always be called apples — though they may be classified as fruits to some. And it is not as if to lose that data? How would our business be affected if we walked in one morning and found our data erased or stolen?

By defining the data, IRM forces the company to ask the following questions: "What would it cost us to lose that data? How would our business be affected if we walked in one morning and found our data erased or stolen?"

At this point, some executives might convince themselves that their data could not be stolen because it would not be of interest to anyone but their company. They might classify the data as highly specialized and unique to their industry. But they would be overlooking one source who will always be interested: the competition.

The first task of a security program — once the value of the data has been calculated — is to limit exposure both from malicious insiders who might want to compromise the system and from unauthorized outsiders who might access the computer by randomly dialing in. The system must be made accessible only to authorized individuals.

The other crucial task in a security program is to provide auditability so the company can further determine where and when its security fails. Until a system has audit controls, there is almost no way of knowing if illegal tampering is occurring.

Data protection methods

Several methods of data protection have been developed to limit unauthorized access to computers. By far the most popular form of security has been logon passwords. While in theory passwords are confidential, keeping them secret is entirely up to the user. Far too often passwords are either stored right on the terminal for anyone to see, or they're predictable and therefore easy for the outsider to guess.

Encryption was once thought to be a security panacea, since scrambled data is considerably more difficult to understand and therefore compromise. But the technology involved in encryption is very expensive for the micro user, and encryption key management is difficult and costly.

Another popular security measure has been software partitioning, which restricts the number of authorized users in certain data files. While practical on mainframes, this technology is difficult to apply to micro.

The newest technology to enter the computer security arena has been callback. Since dial access via telecommunications lines allows the greatest number of unauthorized intruders, this is a logical place to implement security. A callback system takes the first important step in protecting both mainframes and micros. The main purpose of a callback device is to establish connection only via a return call to a previously authorized location.

No one with valuable data base can afford to be naive about computer security in light of the many technical solutions currently on the market. It is time for micro users to become as logical and well-organized in the area of security as the computers upon which their jobs depend.

DAISYWHEEL • DOT MATRIX • THERMAL

FUJITSU PRINTERS

You can't buy more Performance for the Price.

and high speeds. And Fujitsu printers are serviced by TROW, a nationwide service organization.

A Complete Printer Line: Fujitsu's dot matrix printer, with its 24 wire head, offers letter quality printing at 80 CPS. With its ability to also produce draft quality, correspondence quality and high resolution graphics, the Fujitsu DPL24 leads dot matrix technology.

In daisy technology, Fujitsu's SP300 is the fastest letter quality printer in the industry at 80 CPS. Fujitsu's SP320 daisy-wheel printer also provides cost effective letter quality printing at medium speeds. Fujitsu offers thermal printing with its TTP16 printer. The low-cost printer accepts a wide variety of papers and operates quietly at less than 50 dBA.

Call Us Today: Contact Fujitsu America, Inc., at 408-946-8777 for the printer distributor nearest you.

DISTRIBUTORS: Algonex Computer Products (408) 946-8333, (714) 334-3430; CIMA 652-3334, (916) 487-3444; Alton Electronic Associates, Inc. (313) 338-8776, (714) 552-7885, (609) 277-4777, (800) 495-5433; Free Careers Technology (601) 996-6448, (601) 825-2682; Century Associates, Inc. (303) 855-7420, (204) 790-8405, (613) 896-6728, (408) 998-3629, (386) 367-3975, (281) 534-9777, (919) 227-3436, (800) 777-6296, (800) 645-8072, (915) 584-6281; Hapline Associates, Inc. (315) 428-7798, (203) 273-2776; Inland Associates, Inc. (913) 744-7677, (602) 343-3523, (314) 379-6667; Lagoon, Inc. (201) 646-9222; Lantry Computer Products, Inc. (313) 228-7280, (326) 396-5262, (614) 485-7094, (513) 435-7684, (604) 363-9639, (602) 937-3590, (303) 343-3629; MESA Technology Corp. (314) 944-6284, MACO Electronics Corp. (321) 899-2628, (301) 899-4246, (714) 233-4800; Pelt Distributors, Inc. (An affiliate of CyberCom) (303) 396-3369, (404) 794-8406, (317) 347-1336, (215) 363-8377; R. Distributing, Inc. (801) 599-3632, (800) 405-5246; S&S Electronics, Inc. (617) 458-4908, (802) 458-0000, (201) 879-4800, (800) 243-2776; USACATA (214) 649-9708, (212) 684-3575, (703) 442-6200, (916) 623-8740.

PERIPHERAL PRODUCTS DIVISION

Quality Lines



Headache or savior: Organizing micro power

By **Barbara Lefede**
Special to CIB

Two years ago, *Time* magazine named the microcomputer Man of the Year. Today, data processing executives of some large corporations might like to give it a new title — *Troublemaker of the Year*.

Both designations can apply. Without question, the microcomputer has impacted large and small businesses in ways that no device ever has before.

In popularity underscores its value. At the same time, its pervasiveness, its isolation from others of its kind and from corporate mainframes and its steady, relatively uncontrolled proliferation mark it as a major headache for the people whose task it is to maintain order in the expanding corporate push for information.

The truly difficult challenge

We are now approaching the truly difficult challenge faced by MIS management — how to organize the data processing power that resides or is developing within the corporation through its legion of microcomputers.

The task may not be easy, but there are certain measures that can be taken to get the program started and to help make it work.

■ **Take a corporate stance against hardware piece-by-piece.** Corporations must recognize that the cost of microcomputer equipment is minimal in relation to the overall system investment. A free disk drive is insignificant compared with the assurance of expert support and service, for these are fundamental to any coherent system integration. Sometimes a savings of a hundred or two can end up wasting thousands of dollars.

■ **Stream communications.** This is and will continue to be the key, since the name of the game is not merely the computerizing of routine tasks: It is the processing of information and the sharing of that information, as well as accessing other departments' data, the mainframe's data, local data bases and commercial data bases. In short, it is becoming an active participant in the generation and sharing of information.

■ **Someone has to lead a battle against the top-down mentality.** Select a corporate manager who understands the reality of microcomputer use in the company to spearhead the integration process from the bottom up. Remember that imposed solutions will be resisted.

■ **Form a micro integration task force** composed of opinion leaders from all pertinent departments. Work toward linking the departmental networks with each other and with the mainframe.

■ **Keep it personal** — that is, don't let this effort turn into a big corporate project that once again deals in abstractions instead of day-to-day problem solving.

■ **Emphasize making best use of micro** at its optimum-use level — the departments. Integration then can proceed upward with DP professionals guiding the process.

■ **Main integration of micro** attractive to their users. For example, look at electronic mail as a possible

unifying factor.

■ **Understand that some models of microcomputers are not going to fit** into the organization and be willing to sacrifice them. Even in medium-range terms, it will probably be more productive and cost-effective to discard and replace the old models than to try to make them work. Remember that the objective is a unified and coherent system.

■ **In acquiring micro**, make sure there is a choice of compatible systems that fit a range of user preferences. Give these users incentive to standardize.

■ **Think office automation vs. ap-**

plication; solutions vs. product. Micros are rarely used beyond a small percentage of their capabilities, as the usage is extended, the users become more powerful contributors to the information stream.

■ **Deal locally.** Find a nearby dealer who has strong service and support capabilities and be willing to pay for them. Retailers who discount products either in dollars or free merchandise are working with slim margins and simply cannot afford to provide the backup necessary to make micros work in sophisticated corporate environments. If you are paying for service, it is unlikely that

you are getting it.

■ **Assume success.** Full-scale office automation is going to be the rule throughout the business world within a projectable period. Then, as now, microcomputers will be pivotal in the extended information system. It is time to accommodate them.

Once the micro is implemented as a solid participant in the corporate information system, the office of the future can move off the drawing board and out onto the floor where the business gets done.

Lefede is president of Contact Office Automation Centers, a computer retailer based in Los Angeles.

Take a Look at FUJITSU OUR COMMITMENT

Quality, added value, unequalled service. That is the commitment Fujitsu's Storage & Peripheral Products Group is making in the United States. Through development of engineering, manufacturing and marketing facilities in the United States and expansion of field support and repair capabilities, the Group is furthering its position of offering products of quality and value to the OEM and consumer computer peripheral markets.

The Group's line of disk drives and printers reflects our commitment to quality and added value. Value which centers around timely product design, selection of quality materials and components, consistent workmanship, and comprehensive product support.

Wherever you look in the Group you will see professional people answering your needs. Whether it's specialty trained service representatives or engineers working in the Group repair center, their goal remains the same; to provide you with the most comprehensive service available. Service which supports our products and thus offers you added value.

Together, our commitments to quality, added value and service translates into industry standards for reliability, performance and product support. And with the addition of engineering, manufacturing and marketing facilities throughout the United States, the Group will continue to provide you with the best products available.

At Fujitsu we will always strive to be your first choice. The choice where commitments to quality, added value and unequalled service help to facilitate your future growth.

Take a look at Fujitsu. With tomorrow right around the corner, there is no better time than today.

For more information contact Fujitsu America, Storage and Peripheral Products Group, 3025 Orchard Drive, San Jose, CA 95134, 408-946-8777.

STORAGE AND PERIPHERAL PRODUCTS GROUP

We add more Value to help You Further.



Sperry faces the music, attunes its managers

ST. PAUL, Minn. — Some people make better sales in their factories. Others make better sales in their offices. Computer vendors are coming face to face with microcomputers just like everybody else. One Fortune 1,000 corporation is facing the problem of integrating personal computer software into its organization. And recently this company, Sperry Corp., introduced its own personal computer.

In Sperry's office here, Glenn W. Ollila was given responsibility for offering advice on software selections to middle and senior managers who are already using desktop computers.

Ollila's experience as manager of business management systems taught him that the higher managers are in an organization, the faster they want and need information. Personal computers provided a fast, inexpensive way to access and analyze the voluminous information generated by Sperry's data processing department. Using a mainframe on some small tasks is unnecessary, Ollila said. "It's like using a bulldozer to do spade work."

Sperry's experience with the desktop computer is typical of a Fortune 1,000 corporation. In June 1982, at least one-half of the Fortune 1,000 corporations surveyed by International Data Corp. of Framingham, Mass., had no formal plan for personal computers in place.

One year later, fewer than 10% of these corporations were without a written plan. For all of the desktop computers inventoried in the Fortune 1,000 environment, there were at least three times that number in use without sanction.

Ollila described desktop computers at Sperry as "home-brew equipment that has been selected to adapt to each employee's specific needs." Given the number of engineers in his organization, a potpourri of many different makes of desktop machines has evolved to match the specific and ad hoc applications there. Ollila observed on several occasions:

fits of the desktop computer: "These machines allow managers to have an effective dialogue with the data on their own time schedule."

Like many organizations, Sperry currently depends on the numerous mainframes it has in place. These mainframes are used for tracking over 600 projects and may be accessed by thousands of employees. Given the logjam of projects, managers are often the last to get the information they need. Desktop computers allow managers at Sperry to perform extensive data analysis offline when they need it.

According to Ollila, another important feature is portability of the personal computer. Now, managers have the ability to do analysis where they want. Given the universal nature of desktop computers, work can be done at various locations. Sperry engineers are able to carry data on diskettes to outside sites and manipulate the data there, as long as the hardware is compatible with the original hardware back in the office.

Software evaluation is handled by Ollila's department. With cost-effectiveness the prime consideration, Ollila has established four basic criteria

Given the number of engineers at Sperry Corp., a potpourri of many different makes of desktop machines has evolved to match the specific and ad hoc applications there.

'These machines allow managers to have an effective dialogue with the data on their own time schedule.' — Glenn W. Ollila, manager of business management systems, Sperry.

for the evaluation process.

The first requirement is that the software package do the analysis required by the manager in an efficient

and effective manner.

Ollila applies the 80-20 rule. "If a program can do 80% of the job, the remaining 20% can be done outside

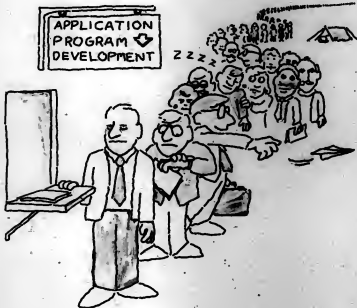
the program," he said.

Secondly, the product must improve the performance of the manager. "Give a desktop computer to a manager, and he can do more work faster and explore more opportunities," Ollila stated. "There is no limit to what he can accomplish."

The third criterion is software selection is ease of use. Ollila weighs the amount of learning required against the benefit of using the package. At Sperry, managers are willing to invest the time necessary to learn a product if they are going to use that product on a regular basis.

The final criterion in the evaluation

m3278/SPF puts micros on-line to mainfra



Included in the m3278/SPF package is PCODE communications by CBI.

SPECIAL REPORT

to linked microcomputing

tion process is customer support. How well is the product supported by the developer of the package? "By the time a manager calls a customer service group, he needs to know quickly how to proceed. In any environment, two hours seems like an eternity," Ollila said. Failure by the software developer to respond quickly to requests may lead to the shelving of a product.

In April 1983, desktop computers were introduced into the organizational and planning department for office automation at Sperry. A short time after the micro's arrival, Roger Grothe was brought on as an organi-

national research coordinator.

His mission was to develop and implement an organizational effectiveness tracking system. The first step was a study in the quality of work life at Sperry.

The original quality of work life survey was developed at General Motors Corp. The 80-question survey is intended to quantify those variables that influence workers' attitudes about their jobs.

The survey was completed by more than 5,000 employees at Sperry. The completed survey was processed outside the company and was returned to the Organizational Re-

search and Planning Department.

It was at this point that Grothe contacted Ollila. "I was looking for a statistical package capable of univariate and multivariate modeling with strong graphics capabilities," Grothe said. "Few products are available with these capabilities, and Statpro was selected because it's



Grothe

a state-of-the-art statistical package," he added.

Statpro is a product developed and marketed by Wadsworth Professional Software, Inc., a Boston-based developer of data analysis software.

Before using it on the survey data, Grothe decided to test Statpro's statistical accuracy. Grothe ran a benchmark using sample survey data from a similar survey involving 8,000 individuals and over 800 characters per entry.

He was able to compare output from Statpro to SPSS, a mainframe statistical product from SPSS, Inc. "The numbers were identical for both univariate and multivariate analyses," Grothe said.

With Statpro, Grothe is analyzing the results of the survey on an Apple Computer, Inc. Apple III. The first step of his analysis is to run descriptive and comparative statistics on the results. For example, what is the average age of employees in the company and in certain positions?

Using these statistics, Grothe can analyze the distribution of data in the survey.

The next step of the analysis utilizes Statpro's color graphics for visual representation of the data.

"This allows us to look at the relationship between the various factors in the survey," Grothe said.

Finally, the regression programs allow further insight into the relationship between variables such as age and performance.

While Statpro was originally selected for the quality of work life study, Ollila reported that its use will be extended to other analyses.

Grothe will be using it in the future for analyzing Sperry's organizational change process as well as for other organizational effectiveness inquiries.

mes and cuts application software backlog.

A substantial increase in the number of on-line programmers is possible with m3278/SFF.

The number of on-line programmers is doubled with m3278/SFF when only 40% of the programming effort is in edit/browse mode. But, when 90% of the effort is edit/browse, a whopping 7 to 1 increase of on-line programmers is realized.

With m3278/SFF, IBM PC users are directly on-line with the host computer via direct (coax) link at channel transfer rates.

Including uploading and downloading programs or datasets. Attaining dataset listings as well as creating local new files or editing pre-existing ones.

Your IBM PC is a distributed SFF workstation allowing simultaneous local and remote SFF software.

Microcomputer users are unparalleled when m3278/SFF operates under PC-DOS.

In addition, a multitask version of m3278/SFF is available for concurrent CP/M-86 users.

Users can perform several tasks at one time by mapping between functions and programs instantly.

For example, editing, compiling, and transferring can be performed simultaneously.

m3278/SFF emulates the 3278 terminal, yet surpasses its capabilities.

No time lost re-educating programmers.

With m3278/SFF, experienced programmers can quickly and easily recognize the SFF emulation

characteristics and operate more efficiently.

Overloading eliminated.

By performing editing functions locally, problems related to mainframe overloading are eliminated.

Mainframe datasets or source programs can be brought down to the microcomputer. Using the same mainframe software in an off-line fashion, datasets can be modified and returned to the mainframe.

No overload. No downtime. No trouble.

How you can cut mainframe application software development backlog.

m3278/SFF is announced for the IBM Personal Computer and all IBM board compatible 16-bit microcomputers.

To find out how m3278/SFF can help turn the 3½ year wait into a tolerable number, contact us today.

A recent survey found that an average mainframe user would have to wait 3½ years for development work to begin on an application requested today.

That's a long time to wait.

In the same study, managers felt on-line programming offered the greatest potential for reducing the backlog.

It was their number one choice.

If on-line programming offers the greatest potential for cutting application program development backlog, what's the problem?

Simply this.

A limited number of programmers have mainframe access at any given time.

m3278/SFF can help.

Programmers on staff become more productive.

Productivity is substantially increased with m3278/SFF.

Why?

Because the programmers' workstation is not down while programs are compiling or downloading.

Coding continues without interruptions.

You may be able to eliminate application backlog without adding programmers. But, it is comforting to know programmers can be added without the expense of another host.

**IBM/36
INFO CENTER.
TODAY! PC**



Call or write for details on FUSION/36 Information Center. Includes integrated retrieval processor (report-oriented) personal database and IBM PC interface to S/36 files.

FUSION

(415) 451-4760
700 LARKSPUR L.C. #200
LARKSPUR, CA 94045
TELEX 110000

PHASER SYSTEMS, INC., 34 CALIFORNIA ST., SAN FRANCISCO, CA 94111 • 415-424-1800

PHASER, IBM and S/36 are registered trademarks of International Business Machines Corporation. Other names are trademarks of their respective owners. FUSION/36 is a trademark of PHASER SYSTEMS, INC.

SPECIAL REPORT

Developer employs creative partnership to

COLUMBIA, Md. — There is planning, and there is planning. Some real estate firms plan developments. Some developers plan neighborhoods. The Rouse Co. has been known to plan cities. This one, in fact.

Now, Rouse is working on a plan for its own microcomputer use. In just over one year, Rouse has in-

stalled 71 microcomputers at its headquarters here and is now pilot-testing their possible use for more than 60 subsidiary locations.

The introduction of microcomputers has been promoted and controlled by the company's MIS department as part of its long-range strategic plan. But the high degree of user acceptance and satisfaction was not ac-

cidental, nor was it achieved solely by the MIS department. It was the result of a creative partnership — in this case, between senior management, user personnel and the MIS staff.

The business of the Rouse Co. is focused primarily in three areas:

- The development, ownership and management of commercial properties, largely retail centers.
- Commercial and residential real estate financing.
- Community development and

urban consulting.

The heart of the company's business is its retail centers. Through subsidiaries and affiliates, the company has developed 36 retail centers, which it owns and manages, and operates 23 additional projects as a result of a five-year-old acquisitions and management effort. Some of the best known retail projects in the U.S. are Rouse-developed and managed — Faneuil Hall Marketplace in Boston, Harborplace in Baltimore, The Gallery at Market East in Philadelphia, The Grand Avenue in Milwaukee and South Street Seaport in New York.

Rouse's community development effort is focused primarily on the new city of Columbia, Md. Columbia, now 16 years old, was conceived and developed by the company in a joint venture with New York-based Cigna Corp. Rouse's urban consulting business is carried on by its subsidiary, American City Corp.

Most of the 300 professional staff at Rouse are financial analysts, designers, real estate developers, project and development managers, accountants, marketing managers and lawyers. They perform a lot of financial planning and analysis, which means they do a lot of computing.

Rouse has been using mainframe computers since 1960, primarily to support its retail center development, operations, mortgage banking

and corporate accounting activities.

In 1982, Ross, Allen and Hamilton, Inc. was asked to help the company review its current data processing systems and resources. The objective was to assist Rouse in preparing a strategic plan for DP, a plan that would include what applications should be developed, what resources would be necessary and how they should be organized.

Senior management adopted recommendations that were both straightforward and appropriate for a decentralized firm such as Rouse. New MIS management, experienced with large systems development and support projects, was brought in. A few critical technical problems were tackled immediately, and system availability was improved to 98%. A realistic schedule for new system development projects was agreed to, and a computer large enough to support these new applications was installed. The plan also prescribed a distributed architecture for most new applications and user-owned and operated applications employing microcomputers.

That was 1982. The timing was right in two respects: Very few micros had been brought in through the back door at Rouse; and microcomputers were just beginning to be accepted elsewhere as legitimate tools for business applications. But at that time, no equipment choice was clear



Baltimore's Harborplace

Rouse Co. photo

The world's most advanced personal computer

It all depends on how you look at it.

As a powerful standalone, the Wang Professional Computer offers data, voice, and image processing.

And Wang word processing, the world's standard. It can support Wang Office, the most comprehensive office automation software in the industry. And it supports the most popular business software available today.



smooth path for micro use

— everything from Apple Computer, Inc. to Zenith Data Systems Corp. products looked promising. There was some question as to whether standardization should be or could be attempted, especially in view of the eager attitude of some of the user community.

The plan was explicit regarding the role of microcomputers.

Microcomputers were most appropriate for many new applications.

Bosse should standardize on the IBM Personal Computer.

The MIS department should responsibly promote, support and control the acquisition of microcomputers.

The company had some problems and made some adjustments, but after a little over a year, microcomputers have become a productive and responsible adjunct to Bosse's central computer resources.

A microcomputer specialist was hired. This position was part of the planned MIS organization structure. The individual had extensive experience with microcomputers and applications. He also had to be an excellent communicator and, perhaps most important, he had to have a service attitude as well as a sense of humor to help users keep matters in perspective.

Personal computer acquisition procedures were established. These procedures called for division head

approval, review of the proposed personal computer hardware and software by the microcomputer specialist, review of the proposed applications by the director of MIS and final review by the corporate controller.

These procedures were not established to frustrate the process of acquiring microcomputers. Rather, senior management was concerned that the personal computers be properly justified, that the envisioned applications be consistent with the overall MIS strategy, that the most favorable terms be obtained and that existing budgetary controls be maintained — just as with any other business decision.

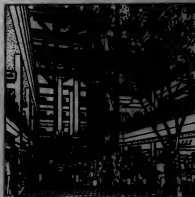
MIS took an activist role, balanced between being a huckster and a wet blanket. At Bosse, while there was very little reluctance to use microcomputers, there was also very little experience with how to use them well. Each new installation often meant a green new with high expectations. MIS paid a lot of attention to the users' first experiences and their first applications, realizing that to achieve the company's goals meant the microcomputer specialist could not just drop off the microcomputer, cables and diskettes and walk away.

The microcomputer specialist acts as an internal consultant. He saves money for the users and makes things happen. He also occasionally

prevents things from happening — like losing a week's work because an one bothered to remind the new user to make regular backups of data.

The MIS department formed an active user group that meets monthly to share experiences and to react to new software products that have been obtained for review. A growing core of experienced and enthusiastic users has helped suggest the microcomputer specialist's role. Within their divisions, these more experienced users can answer many simple questions and show others how to change a printer ribbon or unlock a frozen keyboard.

Training is the most important service. With the help of retailer Computerland, Inc., the MIS department has conducted 16 training seminars at Lotus Development Corp.'s Lotus 1-2-3 in the past eight months. For many, the introductory class also serves as a first encounter with any kind of microcomputer. Advanced classes are also given for Lotus 1-2-3



The Shops, Washington, D.C.

and, lately, data management.

Two portable personal computers are offered for short-term internal rentals. This service has been quite popular at Bosse for persons who just want to try out a microcomputer or to help others through peak work periods.

Today, personal computers are being used mainly for three major overlapping applications: spreadsheets and graphics, statistical analysis with a proprietary system written in APL and as terminals. Other applications include WP, data management, address lists and scheduling.

just happens to be the world's most universal workstation.



As a versatile, multi-purpose workstation, the Wang Professional Computer can be into the entire family of Wang products. It can operate as a virtual workstation on the Wang VS, OS and Z200 systems. And it can even function as an interactive workstation in the IBM environment, either

through remote communications or through local attachment.

The Wang Professional Computer

is more competitive. It's more compatible. No matter how you look at it. No matter how you use it.

For a demonstration of the Wang Professional Computer, call 1-800-225-9264. Or write to: Wang Laboratories, Inc., Business Executive Center, One Industrial Avenue, Lowell, MA 01851.

WANG

The Office Automation
Computer People.

SPECIAL REPORT

Micro users looking for mainframe power

By Paul Pennington
Special to CMAA

During the past year, micro-mainframe integration has grown from a state of casual indifference to one of crisis proportions. Unbounded user enthusiasm has moved the focus of decision support activities to personal computers equipped with spreadsheet and word processing capabilities. While some of this represents a cannibalization of extant mainframe activity, the vast majority of newly formed computing enclaves are coming from a non-computer-based environment.

As the initial euphoria wanes, new users find themselves coveting the data resident on corporate mainframes and in external data sources to use in conjunction with their personal analysis tools. Despite the desirability of using these kinds of data, it has created problems for both analysts and DP managers.

Generally, the analyst lacks the DF skills to design systems to extract data effectively and must instead rely on a series of ad hoc procedures. Concomitantly, the DF manager lacks both the staff to satisfy the ever-increasing demands for data and the tools to provide end users with their own direct access.

Exercises without answer

Although much attention has been focused on the technical difficulties of achieving micro-mainframe integration, the most pressing issues are related to the fundamentals of the decision-making process. In the large corporations, which have oriented their information networks from tracking to decision support, we find an alarming paucity of useful data. Most of the data remains cloistered within user-hostile data management systems. The data that is available to decision analysts is highly disaggregative form and is rarely located within a single environment. Consequently, owing to this lack of a single centralized information data base, the user frequently must manually construct a data base from a wide variety of disparate man-machine systems.

This approach has wreaked havoc on efforts at centralized planning and budgeting processes because individual users are frequently basing projections on differing assumptions and are often working with out-of-date, inconsistent data. This fragmented approach engenders tremendous confusion at consolidation time, when upper level managers attempt to reconcile inconsistencies among departmental projections.

These are symptomatic of both the decentralization of the DFU function and a participatory, bottom-up approach to planning that permits middle managers to exercise greater autonomy. The presence or absence of such a behavioral framework is a critical determinant of the appropriate information processing structure.

As the manager or analyst wrestles with issues of data integrity from the planner's view, the DP manager seeks to provide secure, reliable facilities for the extraction and manipulation of corporate data. At present, many end users transform their personal computer into an asynchro-

nous terminal and use file capture utilities to extract standard corporate reports. After massaging the data, the user can then transfer the data to a micro analysis package.

A boon for end users, this distributed system raises concerns about data security, data redundancy and data integrity for the DP manager. Since the extract is done without the cooperation of the mainframe, little guarantee exists that these proliferating microcomputer data bases contain valid information. There is no error checking during transmission, no logging of the extract and few mechanisms to restrict the capture process.

Investment **expenses**

Traditional data base management systems remain wholly inadequate to address the needs of distributed decision support systems. Their major security objective, protecting a single data base, does not mesh with the needs of a geographically dispersed network with locally intelligent nodes.

Similarly, the DP manager is confronted with an array of distasteful alternatives concerning communications architecture. Although asynchronous emulation is a simple, efficient approach for a casual analyst, it is inconsistent with the large, bi-synchronous IBM Systems Network Architecture, 3270-based settings nor synonymous with large mainframe installations. The advent of protocol converters and the 3270 Personal Computer has ameliorated this concern somewhat, but without the emergence of a unified standard, the manager will be forced to make undesirable compromises due to the multiplicity of possible target environments.

In conjunction with the emerging mainframe communications architecture, local-area networks are occupying a more central role in the design of personal computer communications. While CPU prices continue to drop, peripherals such as printers, plotters and hard disks continue to represent significant investments.

In the case of hard disks, the need goes beyond simple cost efficiency as users progress from personal planners to a more cooperative setting of sharing assumptions, data and inter-

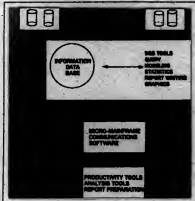
mediate results. File servers attached to a local-area network are ideally positioned to provide low-cost, concurrent access to a community of analysts engaged in a common task.

At the core of the structure of an integrated micro-mainframe decision support environment is an information database that serves as a central repository for data culled from corporate accounting systems, order tracking systems and the like. Additionally, it holds data extracted from external sources. This data has typically been aggregated at least once, but still represents a substantial volume of information.

Effective use of the data base requires a comprehensive set of query and manipulation tools to subset and transform the data. End users must feel comfortable with the language used for ad hoc query and retrieval because, through these mechanisms, they will create composite extracts to serve as the basis for specialized analyses.

As users create these extracts, the system must carefully monitor and log which data is desired by which user so that systems administrators can keep track of the currency of the data employed. Naturally, the system must also prevent users from accessing sensitive data without prior approval.

While many DF managers cast their eyes longingly at relational technology to act as the cornerstone of this network, it is not a uniformly desirable solution. Traditional, flat-file relational data bases with full join capabilities are very well suited for record-oriented data, such as employee files or sales order files. Unfortunately, they are considerably less adept at handling the array-oriented data required for most finan-



cial and marketing analysis. Financial data typically is a cube of data organized by line item, time and reporting unit. Marketing data is similarly organized by product, sales region and time.

Time series or aggregations of time series are best handled by a multidimensional data base manager that presents a conceptually simpler logical data view. In particular, this view is similar to the typical two-dimensional spreadsheet world than in the traditional relational view.

Word for Word

While most of the actual quantitative analysis will migrate to the local personal computer node, it is important to acknowledge the current deficiencies of those systems and to recognize the continuing need for powerful mainframe decision support system (DSS) tools to address large problems. These tools are necessary for volume reporting, large-scale tracking, sophisticated modeling and statistics. The current generation of microprocessors and peripherals remains unsatisfactory for solving large systems of simultaneous equations or for performing the types of consolidation required by many reporting applications.

Ideally, the statistical modeling and reporting tools are incorporated as part of the data management system, but in many cases certain highly specialized needs dictate the use of a less homogeneous arrangement. Some of this can be shielded from the user through the use of menu-driven sequences to activate particular analyses.

Instituting micro-mainframe-based DSS in an organisation is a long and complex process. Involvement of end users and DP professionals is crucial to the evolution of a stable, long-run information plan. Right now, the end-user rush toward microcomputers is a step in the right direction toward a more comprehensive solution.

Puzzanghera is a product manager for microcomputer products at Management Decision Systems, Inc., a Waltham, Mass.-based vendor of mainframe-based DSS.

For your IBM PC and your mixed peripherals...

Introducing Back-Up™

You put the IBM PC into your company because just about everything in computers today is compatible with it. But then, you found you had a problem — incompatible service programs. IBM will only maintain their own machines. And the "general specialists" try to be everything to everybody. So, who do you call when you want *specialized AND flexible* service?

New From Control Data

You call our new Back-Up service because we specialize in maintaining the IBM PC. Because we'll service your mixed brands of peripherals too. And, because

we're the oldest national maintenance organization servicing IBM computers, outside of IBM. An unbeatable combination — expertise, flexibility and dependability.

Custom Designed Flexibility

Flexibility is what makes our Back-Up service unique to the industry. It's changeable, rearrangeable and expandable to fit your company's specific needs. We're also nationwide, so your other offices have coverage

too. Best of all, you will normally be back up and running in four hours flat.

1(800) 346-6789
Will Get You Back-Up

Call us for more information. If you're in Minnesota, call (612) 292-2209.

No one should be without Back-Up. That's what we are. It's what we give you. And that's what you'll be. From the High Touch Professionals at Control Data.


**CONTROL
DATA**



IBM PC and IBM are registered trademarks of International Business Machines Corporation.

Ski resort gets lift from reservation system

ASPEN, Colo. — Life used to be simple. If you wanted to go skiing for the weekend, you could pack your ski, hop in your car and drive off to a snowbound inn for the weekend. Life isn't simple anymore. Try that now, and you'll wind up sleeping in a snowbank. These days you need a reservation.

Until recently, the automated processing of reservation information for a major resort was a job for airline-site reservations systems. The Aspen Resort Association (ARA), with 104 properties that include over 11,000 beds and over 20 different amenities, had been doing it manual-

ly for several years.

The push to computerize came primarily from the Colorado Ski Co., which markets most of Aspen's lodging, lift-ticket and transportation packages. Jack Brandinger, president of the company and one of the chief proponents of the system, organized a committee to investigate systems companies and software products that claimed to have the sophistication to get the job done.

Brandinger saw a critical need for improvements in two areas: reservation handling speed and retention of customer information. Reservation handling speed, in particular, is im-

portant because most potential customers call long-distance and want their questions about reservations answered quickly and pleasantly. The smoothness with which customer relations are initiated sets the tone for a lasting relationship. Retention of customer information, on the other hand, proves a tremendous aid to marketing efforts.

With the aid of Gulf Stream Management Systems, Inc., the computer systems company contracted by the ARA to provide computerization, things began to change. Adding IBM Personal Computers and the Novell, Inc. Netware/3 local-area network

and Netware operating system to its own GSM/100 central reservation system software, Gulf Stream designed a package for the ARA. It features a color display management system and the ability to perform over 75,000 transactions a year.

Gulf Stream, which had marketed other products in the Rockies and had worked with the Colorado Ski Co. before, was familiar with the quality of the ARA's manual reservations system.

Resource shares

Since Gulf Stream specializes in applications software, it was necessary to locate other specialists to complete the system. Greg Friedman, one of the original Gulf Stream partners, reflected on the company's search for an adequate local-area network and operating system: "We knew what we needed in terms of functionality and capability. We then set out to see what the marketplace had to offer." Friedman's expertise in IBM communications networks led him to view the search as a quest: "We came to that conclusion, not easily, but after agonizing, going through all the other products and finding that they were really . . . resource sharers rather than multiprogrammable networks."

The hardware that Novell provided, Netware/3, supports up to 24 microcomputers, 300M bytes of mass storage and up to five shared, spooled printers. Each workstation is connected by its own cable (which may be up to 3,000 ft long) to a central file server in a radial or star configuration. Friedman said, "Novell started with a network processor that is faster than the CPUs or computers that it serves. As a result, Novell developed a comprehensive set of software on which one can scaffold systems of complexities that were previously only implementable on mainframes."

The ARA's reservations computer system is designed to access 21 active data bases containing information on every aspect of the resort and all related reservations information. When a reservationist receives a telephone call requesting accommodations with certain amenities, such as a telephone or a television, or access to a pool, jacuzzi or tennis court, he can prompt the system and obtain availability information in three seconds. If the appropriate accommodations are available, the operator can then access each data base necessary to complete the reservation. "Beyond this," said Betty Farnon, director of reservations for the ARA, "the system will make it much easier for us to stay in touch with our guests."

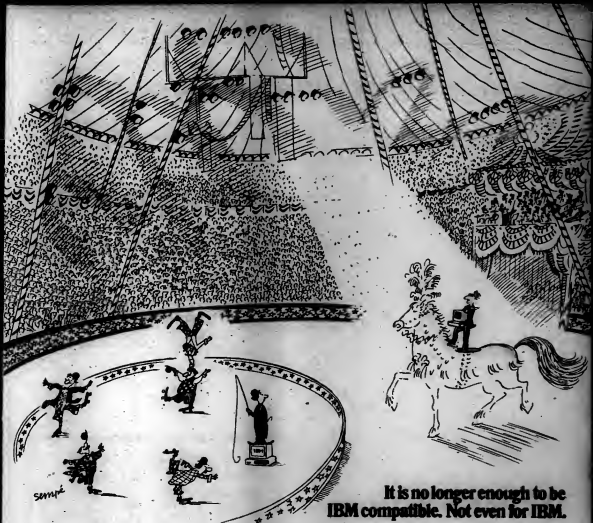
The GSM/100 system provides a software package that allows trend analysis and reporting of significant summary data for the management decision process. It also has word processing capabilities.

Reservationists, who spend hours at a time in front of a computer monitor, are aided by menu-driven software that uses color to communicate the terminal operations without the use of written words. For example, all input fields are in yellow. Using color to designate fields, display screens are far less cluttered and recognition of an event occurs faster.

Does your
MICRO-TO-MAINFRAME
LINK
look like
this?

Hundreds of companies
have installed
MICRO-TO-MAINFRAME
LINK
because it provides.

MICRO-TO-MAINFRAME
LINK



**It is no longer enough to be
IBM compatible. Not even for IBM.**

It was the personal computer circus.

And it had gone on too long.

The crowd grew restless as each new act continued to perform varying degrees of IBM compatibility.

Suddenly, the crowd gasped. It was the unexpected finale—the arrival of Sperry, with a performance no one could have imagined possible.

Ladies and gentlemen, it was the Sperry PC. It ran IBM compatible software.

But that wasn't the show stopper.

Because it soon became quite clear the Sperry PC didn't just run the IBM programs, it ran them better.

Better because it ran them faster—up to 50% faster.

It ran them with breathtaking graphics, far more dramatic than the IBM PC could provide.

And it ran them from a keyboard that drew roars of approval, for it was not only easier to operate, but far more comfortable than IBM's.

And as the crowd cried out for more, that's just what Sperry gave them: the

ability to plug right into a company's main computer, whether that system was IBM or Sperry. Or both.

As the crowd sat stunned by this final flourish, Sperry left all with a most provocative question. Was it possible

that the Sperry PC could do all of this and yet cost less?

Again, the crowd gasped.

Could it be?

Come see for yourself. Hands-on, side-by-side. Call 800-547-8362, toll-free. Or write us, Sperry Corporation, Computer Systems, Department 100, P.O. Box 500, Blue Bell, PA 19424.

SPERRY PERSONAL COMPUTER SPECIFICATIONS	
OPERATING SYSTEM	KEYBOARD
MS DOS Version 1.0 or 2.0 with G.W.	84 keys, 9.8, used
RAM: 128K	AUXILIARY MEMORY
ALARM: MICRO	Up to two internal 5 1/4" diskettes 5.25"
PRINTING: High speed 10 cps 800	Internal hard disk
DISPLAY SCREEN: High Definition	When configured with single diskette
Mouse: Optional	VIDEO MEMORY
IBM compatible	Standard 128K bytes, expandable to 512K
COMMUNICATIONS	DIAGNOSTICS
RS-232C	Programs and test
	CLOCK
	Time-of-day with battery back-up

SPERRY



The Sperry PC.
What the personal computer
should have been in the first place.

Spreadsheets save brokers data entry time

NEW YORK — A few days before financial statements are presented to the board of directors of Robb, Peck & McCony Clearinghouse Corp., a New York brokerage house, the accounting manager loads his copy of a spreadsheet program into his personal computer. Pressing a key, he selects a report to be downloaded from the mainframe computer 10 floors above. After a few seconds, a copy of the balance sheet appears on the spreadsheet, ready for analysis.

This is just one method of using micros to aid in financial analysis applications. Many users often find themselves devoting a large part of

their time on the microcomputer to keying in data. The goal at Robb Peck was to relieve managers from the data entry function, then they could devote more energy to analysis.

When first presented with the idea of a personal computer network linked to the mainframe, the DP department tried to determine if there really was a need for micros. Robb Peck already had an interactive system developed on its IBM System/38 mainframe running CPF that allowed users access to functions ranging from account maintenance to a sophisticated stock price analysis system. While this was adequate for most situations, there were no spreadsheet or word processing applications available on the mainframe.

In reviewing the pluses and minuses of microcomputers at Robb Peck, an important advantage was found in the diversity of inexpensive software written for micros. To reproduce a spreadsheet package on the mainframe would be very costly either in terms of in-house development or through purchase from an outside vendor. Last fall, Robb Peck decided to purchase its first micro: IBM Personal Computer with Quantum Corp. memory boards that brought the available random-access memory to 512K bytes. However, along with this decision came an entirely new set of challenges.

Post development stage

The first stage of development went very smoothly. Robb Peck acquired a terminal emulation package from IBM that allowed the micro to act as a terminal or as a free-standing micro. A file transfer package utility was obtained to allow files to be transferred from the mainframe to a virtual disk drive that the microcomputer interprets as drive D.

The difficulty began with loading data into the spreadsheet package being used, Lotus Development Corp.'s Lotus 1-2-3. While the file transfer utility converted REXX code from the mainframe to ASCII on the micro, this was not enough to import data into the package.

Before that could be done, a few alterations were needed such as placing quotation marks around character data, inserting delimiters between fields, hard-coding decimal places and placing the negative sign (if applicable) in front of the leading digit of numeric data.

Other firms had attacked this problem by hard-coding these specifications directly within programs on the mainframe.

Robb Peck's solution consisted of writing a generic program on the mainframe, whose only requirement was the existence of a mainframe file containing the data to be downloaded. The Robb Peck program picks up what type of data is input and modifies each field accordingly. The result is a work file automatically formatted for input into the spreadsheet program on the microcomputer.

Once there was formatted data, a problem remained with finding a downloading method simple enough for people with little computer expertise to use. Robb Peck chose to take advantage of both its users' familiarity with the mainframe menu system

and the fast processing capabilities of the mainframe. This resulted in most of the processing functions taking place on the mainframe.

By linking micros with the mainframe, users at Robb Peck now have

the ability to manipulate considerable data without having any programming experience. Consequently, microcomputers have become a valuable supplement to the regular data processing functions.

BUYING PERSONAL COMPUTERS DIRECTLY FROM IBM?

Estec Services is the cost effective method for quick and easy installation of Personal Computers throughout your organization. Our purpose is to provide the end user with an assembled and tightly tested personal computer to use complete system without straining the resources of your company. The complete system includes the PC host plus optional services such as the installation and testing of 3270, 3201, and 3280 emulators, customized software, your personal operating instructions, supplies, etc. Our basic offering is 5 to 10% of your total hardware costs.

Here are 5 of 25 reasons why you should use Estec Services:

- #1 Increase user's satisfaction and compliance with a highly organized installation approach.
- #2 No expense incurred in finding, hiring, and training qualified employees for a new time task.
- #3 No need to calculate the space required and the cost for reaching, assembling, starting, and reshaping of PCs.
- #4 Estec Services will manage and perform upgrade services to a standard level for all your presently installed PCs.
- #5 To meet your unique requirements Estec Services will install and test OEM components or devices at our facilities.

ESTEC stands for "Excellent Service To Every Customer". We are located in the heart of major distribution channels for quick and low cost shipment to the U.S. and abroad.

Write or call us for additional information. For an estimate, please make available your PC model numbers, configurations, and quantities.

Estec Services, Inc.

P.O. Box 3018, Edison, NJ 08818

(201) 268-6688

IBM is a registered trademark of International Business Machines Corporation

PERSONAL COMPUTERS

An Executive Overview Program

Developed by Paul Marwick and Dialog Systems Inc. to provide the busy executive with an overview of the technology that is changing the way America does business.



PROGRAM AT A GLANCE

- Introduction to Personal Computers
- Processing & Storing Information
- Software
- Spreadsheet Analysis & Database Management
- Word Processing and Communications
- Graphics and Integrated Software
- Needs Assessment
- Software and Hardware Selection
- Vendor Selection, Service & Support
- The Impact of Personal Computers
- Case Studies
- Future Trends
- Glossary

Please send me _____ programs @ \$79.95 (complete package includes six diskettes and one printed Self Study Guide) to:

Name _____
Company _____
Address _____
City/State/Zip _____

— My money back guarantee

DIAGLOG SYSTEMS INC.
770 BROADWAY
NEW YORK, NY 10003
212-679-8888

2 Comprehensive "HANDS-ON" Workshops

LOTUS 1-2-3 AND dBASE II

Learn on the IBM Personal Computer • Expert guidance by multiple instructors • Limited class size • Exercises solve real-life business problems

Also Available • Advanced LOTUS • Advanced dBASE II • PC Library

LOTUS 1-2-3

May 3-4 Philadelphia
May 8-9 Englewood
May 9-10 New York
May 15-16 Stamford
May 21-22 New York
May 24-25 Atlanta

dBASE II

May 4-5 Philadelphia
May 7-8 New York
May 9-11 Englewood
May 17-18 Stamford
May 24-25 New York
May 24-25 Atlanta

Also, Multiple • Multiple • The Word • Knowledgebase

We're the BEST, call to find out why!



For more information about these and our evening and weekend "HANDS-ON" Management Workshops call Comped at 1-800-323-7822 or 212-666-0000

John 1213 a member of Lotus Development Corp. (IBM, dBASE II, and Lotus 1-2-3 are registered trademarks of International Business Machines Corporation and Lotus Development Corporation, respectively.)

Comped Learning Centers
10 East 21st Street
New York, NY 10010

and/or low-cost PCs, terminals and printers, to communicate with an IBM mainframe host. ASCII to SNA/SDLC 3270 emulation.

☛ The PCI 171 protocol converter. Designed for companies who want to use ASCII devices to communicate in an IBM Busic environment. ASCII to BSC 3270 emulation for non-SNA applications.

☛ The PCI 167 protocol converter. Use virtually *any* ASCII device to speak SNA, including low-cost terminals, printers, teletype printers, graphics plotters, micros, etc., etc. It's the NFO software equivalent: ASCII to SNA/SDLC 3270 emulation.

Technology eases micro users toward DDP

By Wayne Nathan
Special to CWS

One solution to the corporate use of micros is to turn all micro users into DP professionals trapped in the arena of data administration and support. Unfortunately, the typical user is a part-time computerist and a full-time analyst. It rarely serves the corporate interest to cross the two disciplines.

The technology of distributed processing has gone a long way toward eliminating the microcomputer user's dilemma. With it, micros and mainframes communicate intelligently and easily, and software syntax is identical regardless of which hardware the user chooses.

The corporation is served because concerns such as security, integrity and audit trails can now be primarily satisfied by a DP professional through mainframe administration. Establishing intelligent communications enables the micro to serve as both a stand-alone machine and a terminal, greatly increasing utilization.

The users' productivity needs are met by distributed processing because users can now use the hardware that is appropriate to the application without the obstacle of learning a new language. More significantly, they are no longer put in a position of laboring over gymnastic micro programming tricks to achieve the desired level of real-world simulation.

In a distributed environment, the micro can be used for small application development and execution, data entry and large model development to be uploaded and executed later on the mainframe. The mainframe still fulfills its main roles of storehouse for large corporate data bases and powerful central source for corporate-approved calculations and libraries of routines.

Recent experience has highlighted one problem not solved by adding compatible syntax to intelligent communications.

Watch an analyst who is used to the friendly, human-factored micro log on to a mainframe system. Even if the analyst is fortunate enough to retain the full screen environment (rather than a line-by-line one), many of the human factors that made microcomputing so attractive disappear on the mainframe. The unfortunate result is that the distributed system still has strong disincentives for the user.

Recent experience has indicated that in addition to intelligent communications and compatible syntax, the user requires compatible environments to embrace fully main-

frame computing as an application dictates. Some of the environmental factors are:

- Full screen capabilities to duplicate the easy cursor-controlled editing that is so comfortable and productive for users.
- Spreadsheet capabilities enabling the user to en-

ter, view and perform "what-if" analyses of their model in the mode that made micros so popular in the beginning.

■ Query-by-example as a technology to reduce the transition from simple spreadsheet applications to more sophisticated real-world mainframe applica-

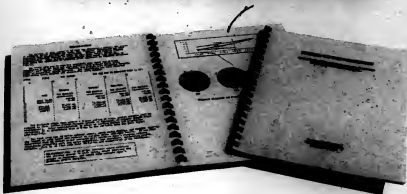
tions. Through query-by-example, the number of operating and system commands is greatly reduced. In a syntax-free environment, learning curves are reduced, and productivity increases.

There is much to indicate that the introduction of a distributed technology goes a

long way toward reducing many of those problems, but only if it is used.

Burton is manager of decision support systems product management at Comshare, Inc., an Ann Arbor, Mich.-based vendor of decision support software and services.

NEW FROM CINCOM: THE MANAGE USER SERIES™... MAINFRAME PERSONAL COMPUTING POWER WITH DP CONTROL.



Micros worth little without communications

By Robert Bruggi
Special to CWS

Computing isn't everything. The proliferation of microcomputers has promised to satisfy the demand for information access. However, technology that would enable communications across all networks, hard-

ware configurations and software applications needs to be developed.

Some current products offer more hope of accomplishing this than others. The protocol converter, or black box, provides a basic protocol translating capability, converting the interchange code

between Ascl devices and mainframes in Binary Synchronous Communications (BSC) and Systems Network Architecture/Synchronous Data Link Control (SDLC/BSDC) networking environments. However, protocol converters are typically limited in function and do not

feature data capture and retrieval functions.

The coaxial connection, an intelligent hardware/software product with an on-board processor and memory, provides data capture and retrieval functions through simple buffering of display screens. However,

the coaxial connection only operates by plugging into an available port on an expensive IBM 3270 cluster control unit in a local environment.

Software communications solutions are the most complex, with extensive capabilities for porting across product lines.

Large software integrators are providing products that are tightly coupled between the mainframe and the micro. This type of product offers extensive file transfer capabilities. However, the products assume that applications on the mainframe are written specifically to drive applications on the personal computer. These coupled software products typically only work in vendor-specific environments, such as communications - software will only access each vendor's mainframe and application software.

Other software products enable micro-to-mainframe communications in BSC and BNA/SDLC environments by emulating commonly supported devices such as IBM 3270, 2770, 2780 and 2790 terminals.

Multiplatform emulation

Another important feature is the multiple-terminal emulation and multiple-protocol capabilities of these products. In addition, some of the software emulation products are machine independent and are designed with a modular architecture, allowing for easy porting across microcomputer product lines.

The major obstacle to the software emulation product's performance in the market will be the fact that the software is resident only on the micro. Software emulation manufacturers either will make the move to mainframe software or will coordinate with mainframe software manufacturers to provide access to a variety of host applications and data base management systems.

The mainframe software, in turn, should not be vendor-specific, but instead should act as a clearinghouse for a variety of requests from the personal computer to access information resident in files, programs and systems produced by multiple-vendor mainframe products. The future communications product should allow users to specify almost unlimited criteria and, by virtue of the intelligence of the network, have information returned in a form appropriate and usable at its destination.

Bruggi is president of Pathway Design, Inc., a Woburn, Mass.-based vendor of data communications products.

MANAGE USER SERIES

Cincom's new MANAGE USER SERIES™ combines the benefits of personal computing capability, mainframe power and greater data processing control into one comprehensive Decision Support System.

Personal Computing On The Mainframe

Simply explained, the MANAGE USER SERIES is Cincom's family of integrated mainframe software tools that work together as one powerful Decision Support System. No other software vendor offers such a wide range of Decision Support capabilities at the mainframe level.

Using the power and accessibility of the mainframe, MANAGE enables data processing to provide a wide range of personal computing capabilities while maintaining control over the corporate data resources. And because MANAGE has a conversational, user-friendly personality, it easily wins friends among end-users.

Powerful Decisions Support Tools

The MANAGE USER SERIES currently integrates four powerful tools that allow end-users to access, store and use production information from the corporate mainframe to aid in key business decision making:

- **MANTEXT** is a sophisticated free-form text processing system that enables users to access corporate files for the creation of business documents and corporate mailings.
- **MANGRAF** is an advanced business graphics tool that provides output from on-line applications using centralized production data base information.
- **MANCALC** is a 3-Dimensional electronic spreadsheet that facilitates "corporate-size" models and can automatically load information stored in

corporate files, or build models based on private data as well.

- **MANTIS** is Cincom's industry acclaimed application development language. As the "integrator" of the MANAGE USER SERIES, MANTIS provides an effective bridge between the Development Center and the Information Center.

End-user Productivity Through Integration

The key to the power and versatility of MANAGE is its elegant integration. MANAGE provides the tools needed for preparation of business reports and day-to-day decision making. And because all components of MANAGE can access central or personal data files, users can merge a multitude of data types, display them graphically, simulate "what-if" features and document the findings in one business report. The power of MANAGE is limited only by one's own creativity.

Another Major Cincom Technology

Like TIS™ ULTRA Interactive Data Base System™ MRPS™ and MANTIS™, MANAGE USER SERIES™ is a member of the integrated family of new Cincom software technologies. From data base to application software to Decision Support, the name Cincom has come to stand for excellence in software technology the world over.

For more information on MANAGE, or any of our new integrated software technologies, simply contact The Cincom Marketing Services Department, 2300 Montana Avenue, Cincinnati, Ohio 45211.

800-543-8000

(In Ohio: 513-661-8000)
(In Canada: 416-278-4220)



Cincom Systems

Excellence in Software Technology.

For the best micro/mainframe marriage
you need a plan.



DYNAPLAN

1-1-2-3 for
VME/CMS and MVS/TSO

DYNAPLAN formerly Dynalink,
now enables the user to combine the
micro with main frame power.

DYNAPLAN provides all the popular
features of Lotus 1-2-3 and
VisiCalc.*

For a free 30 day trial call (312) 525-4499

Chicago, IL

738 N. LaSalle, Chicago, IL 60610

Dynalink was registered trademark of Dynalink Corporation, 1-2-3 was registered trademark of Lotus Corporation. VisiCalc is registered trademark of VisiCorp.

Voice technology coming for microcomputers in 1984

By Elliot Friedman
Senior to CWT

Consider the initial implementation of voice technology: a microcomputer acting as an answering machine, with telephones as terminals. And consider the manager who would make the most use of the technology: a corporate professional with a personal secretary, an executive who is probably not interested in being linked to a microcomputer. A microcomputer would seem a large investment for so limited an application.

In 1984, voice applications for mi-

cro will be broadly available for the first time. That means voice applications can be integrated with other applications (word processing, spreadsheet, and so on) and put on the manager's desk.

Voice is digitized and stored on a hard disk for playback later, usually at another workstation. The sender's digitized voice sounds like a tape recording, not a computer voice. The stored voice can be incorporated into various types of files and forwarded, or sent alone as a voice message.

The usefulness of voice technology is best demonstrated by example.

■ **Voice enclosure.** The report you receive from the director of marketing via electronic mail is flagged with a voice message. You hit a key and hear a voice: "I know you're not going to read this whole thing; look at the graph on page 8 and the summary at the end."

■ **Voice annotation.** Accounting sends you a work sheet with sales figures for the last six months. You send the work sheet to the West Coast sales manager with a voice message attached to the February total: "These are pretty low compared to projections — what happened?"

■ **Dictation.** You dictate a memo and send the voice message to your secretary, who types it up and sends it to you for review. You return it with a voice message plus comments.

■ **Antidial.** Justification, note taking. You receive a message from a client requesting justification of a charge for a two-hour telephone consultation — he doesn't remember the call. You call up his file and request the telephone note for that call. The time the call was placed and the length of the conversation, plus the client's name and telephone number, had been recorded by the computer on a preformatted screen. The screen also includes your notes from the call. You press a key, and the computer dials the client's number; you remind him of the conversation and the decisions reached and promise to send him a printout of your note.

■ **Voice mail.** At 8:00 a.m. you call up the names of your 60 sales reps. You record a voice message. The micro dials the sales reps' numbers and sends the digitized message to their computers. When they sign on in the morning, they all hear your message.

■ **Answering machine with individualized message capability.** You are expecting several important telephone calls during the day, but will be out of the office. You leave each of the expected callers a personal voice message, with specific instructions. By dialing an assigned access code on a Touch-Tone phone, each caller will hear his message.

All of the above can be done on microcomputers now. Some hardware is already available, and software should be coming out in the next few months. The MIS manager implementing a micro strategy in a large organization is struggling to help users communicate — now voice applications for microcomputers are a viable option.

Friedman is chairman and chief executive officer of Pro Computing, Inc., a New York-based software firm.

Shouldn't You Have a Multi-User Business Computer?



If you bought a personal computer to handle your business, you shouldn't have.

Because a personal computer gives you just one keyboard and one screen. If, for instance,

you need to check a customer's current credit status while your computer is grinding out the payroll, you're forced to ship an order on gut feel or disrupt your payroll process. Either way it hurts you.

More Power To You

What you need for your business is a real multi-user, multi-tasking business computer: Pertec's System 3200. You can concurrently check credit status at one workstation, run payroll on another, pull a financial statement at a third, review inventory at the fourth, do word processing at the fifth.

Start with a desktop model and grow to 32 workstations. Our MVS- or MVS-compatible family of systems can address up to 4 million bytes of main memory and handle nearly half a billion bytes of Winchester storage—equivalent to 300 full-length novels. And you can have your choice of operating systems: CMS-3200, UNIX, PICK, or MIBOS.

High IQ, PDS

System 3200's workstations are intelligent. A dedicated microprocessor and memory lets each workstation process information without interrupting the system CPU.

Workstations can be directly linked up to a mile away by multi-drop coax that transmits data at rates far in excess of typical RS-232 connections.

Hot Applications

Backing up Pertec's record-setting hardware is a broad range of software. Including industry-standard Business Basic and COBOL, CP/M-compatible programs, and Pertec's proprietary applications library.

Differential Pricing

Buying Pertec's System 3200 lets you save about 40 percent of what you might otherwise spend to get comparable capability. Compare the price of our multi-user system with an equivalent number of personal computers, and you'll see the point.

Strike While The Iron Is Hot

Pertec has the hottest iron in the industry. A demo will show you how serious we are about real business computers. Return the coupon today for the location of your nearest Pertec Authorized Distributor/Dealer.

Computers for Business Growth

A DIVISION OF THE TECHNOLOGY CENTER GROUP

I'm serious about a multi-user business computer. Rush me details of System 3200, plus the location of my nearest authorized dealer.

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Phone _____

Type of business _____

☐ Computer distributor/dealer

PERTEC COMPUTER CORPORATION

1712 Armstrong Ave., Irvine, California 92713-9602.

Telephone (714) 660-0488 TWS 995-182. CWT

Background: IBM PC, International Business Machines Corporation; Apple, Apple Computer; TPC, Texas Instruments; CPM, Digital Research; UNIX, Bell Laboratories; PICK, Pick Computer Systems.

See us at **COMDEX** Booth 6550

The TeleVideo IBM PC compatibles. The best hardware for the best software.

TeleVideo versus IBM. Make a few simple comparisons and you'll find there is no comparison.

BURNS IBM SOFTWARE.

With the TeleVideo® IBM Compatible line—PC, XT and portable computers—you'll get the most out of all the most popular software written for the IBM® PC—more than 3,000 programs.

Because every TeleVideo Personal Computer offers the highest level of IBM compatibility on the market and has the standard—not optional—features you need to take full advantage of every job your software can do.

THE BEST HARDWARE FOR THE BEST PRICE.

Feature	IBM PC	IBM XT	IBM AT	IBM XT
Monitor	YES	OPTIONAL	YES	OPTIONAL
Screen Size	YES	NO	YES	NO
File System	YES	NO	YES	NO
Quiet Operation	YES (NO FAN)	YES	YES	YES
Memory	YES	YES	YES	YES
Graphics Display	YES	OPTIONAL	YES	OPTIONAL
(640 x 200 resolution)	YES	YES	YES	YES
Printer Port	YES	OPTIONAL	YES	OPTIONAL
Communication Port	YES	OPTIONAL	YES	OPTIONAL
MS-DOS/BASIC	YES	YES	YES	YES
System Expansion Slot	YES	YES	YES	YES
RGB and Video Port	YES	OPTIONAL	YES	OPTIONAL
Typical System Price	\$899	\$899	\$999	\$999

Study the chart below. It proves that TeleVideo—not IBM—offers the best hardware for the best price.

Note that TeleVideo's ergonomic superiority over IBM extends from fully sculpted keys and a comfortable palm rest to a 14-inch, no glare screen that tilts at a touch.

THE BEST MICROCHIPS.

What is perhaps most impressive about the TeleVideo IBM PC Compatible can be found deep within its circuitry. We use the same 8088 central processing unit that runs an IBM PC. But we also employ new VLSI (Very Large Scale Integration) microchips that are designed and built exclusively for TeleVideo. These interface more efficiently with the powerful 8088 and yield numerous benefits.

For example, our tiny custom chips do the work of many of the larger, more expensive circuit boards in an

IBM PC. So we can offer a computer system that comes in one attractive, integrated case, is ready to run and occupies less desk space. A computer that edges out IBM's added-cost component system for reliability, ease of service and purchase simplicity.

Fewer circuit boards to cool also allowed us to eliminate the noisy, irritating fan IBM and most other PCs force you to put up with. And TeleVideo compatibles accept any IBM hardware options without modification.

THE BEST PORTABLE FOR THE BEST PRICE.

Feature	IBM PC	COMPAQ
High Capacity Storage	YES	NO
2nd Disk Drive	YES	OPTIONAL
Quiet Operation (No Fan)	YES	NO
Ergonomic Display	YES	NO
Communication Port	YES	OPTIONAL
Internal Power Supply	YES	NO
MS-DOS 2.11	YES	NO
Graphics Display	YES	YES
Typical System Price	\$899	\$999

THE BEST LINE.

But the Tele-PC is only one element of the TeleVideo IBM PC Compatible line.

The TeleVideo XT is the best hardware for users of popular IBM XT software who would appreciate an extra 10 megabytes of storage capacity along with the advantages listed on the chart at the left.

As the chart above demonstrates, our portable IBM compatible computer, the TPC II, is far and away better hardware than COMPAQ®. Better hardware—standard—at a better price.

THE BEST MANUFACTURER.

The TeleVideo IBM PC Compatible line is made

by the world leader in multi-user computer systems and the number one independent manufacturer of terminals.

Our compatibles are available at participating ComputerLand and Entel (call 800-HI-ENTRE) dealers or you may call 800-538-8725 for the dealer nearest you. In California, call 408-745-7760.

Before you invest, make a few simple comparisons. You'll find that TeleVideo—not IBM or COMPAQ—is the best hardware for the best software. At the best price.

IBM is a registered trademark of International Business Machines. MS-DOS is a trademark of Microsoft Corporation. COMPAQ is a registered trademark of Compaq Computer Corporation. (Entel) is a trademark of Entel Computer Corporation.

TeleVideo
Personal Computers
© TeleVideo Systems, Inc.

Microcomputer users consider new uses

By Paul D'Arcy
Senior Editor

Until recently, the suggestion of implementing Cobol on microcomputers would have raised more than a few eyebrows among programmers and data processing professionals. Since DP managers regard micros as machines limited to spreadsheet and word processing applications. Other DP managers think Cobol's long association with the mainframe hardware environment has contributed to its narrow description as a batch-oriented, slow, verbose and memory-intensive language — unsuitable for use on microcomputers.

The availability of interactive Cobol and powerful multibus 16- and 32-bit microcomputers with large storage capacities is helping to change the roles of both the language and micro-based systems. Many DP professionals view personal computers as individual workstations that corporate managers can use for decision support functions, such as budgeting; however, another view is emerging that sees personal computers as delivery vehicles for distributed processing or as providers of a productive way for DP departments to develop and maintain Cobol applications that run on the central mainframe computer.

To be used as Cobol development and maintenance stations, micros and mainframes must have a common software denominator.

Blurring distinctions

It is widely believed that distinctions between micros, minis and mainframes will continue to diminish. Cobol for micros supports this trend with fast, effective performance on systems ranging from 8-bit micros to large, 32-bit systems. And to allow programmers to interact with executing programs, check data values and set up "what-if" situations — capabilities generally not available on mainframes — tools as interactive source-level debugging packages and source code generators that run on micros are now available.

These programmer productivity tools demonstrate that microcomputers and interactive Cobol development software offer a productive solution to the problem of creating and

maintaining business applications.

When microcomputers first appeared on the market, they were primarily implemented as stand-alone systems that allowed individuals to perform word processing and spreadsheet functions for decision support. More often than not, DP personnel in large companies frowned upon personal computers because different departments often ended up independently purchasing a mix of incompatible machines.

As the popularity of microcomputers spread, however, DP managers began to realize the systems could be used in several new ways: as intelli-

gent mainframe terminals, as mainframe program development stations and as delivery vehicles for distributed processing. This strategy provides two important benefits: It removes a significant work load from corporate mainframe computers, which free CPU time for more productive central data processing tasks; and end users can more easily access the information and information processing resources they need.

Optimizing resources in this manner also increases individual programmer productivity. With their own microcomputers readily available, programmers can download and

execute mainframe applications for testing and maintenance with minimal conversions. They can also develop new applications for uploading to the mainframe without the interruptions that often occur when using the central mainframe resources.

With a stand-alone system, the user does not have to wait for editing functions to become available or for a systems administrator to queue jobs for execution or for a high-priority printout to be completed. Instead, the microcomputer provides a personal, easily accessible, interactive world that allows programmers to achieve complete control over the system and



**IRMA has worked
her way to the top.**

She's Director of Decision Support, the leader in IBM 3270 mainframe/PC networks.

IRMA is taking charge! Her performance in over 25,000 IBM 3270 mainframe/PC installations has made her the industry's leading Decision Support Interface. Why? Because IRMA works. Easily and economically, IRMA's on the job giving PC users, mainframe data access, selection, storage and communication back to the mainframe.

She's more capable than ever.

IRMA is a printed circuit board that slips into any available IBM PC/PC XT slot and attaches via coaxial cable to a 3270 controller. She's as easy to work with as the PC itself and provides standard text file transfer software

of Cobol implementation

how their tasks are handled.

In addition, micros are interactive by nature and do not interfere with mainframe operations, while interactive development of applications on a mainframe takes up large amounts of memory.

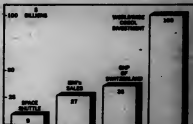
Running standard Cobol on both mainframes and microcomputers enables users to collect central data on the personal computer and store locally processed information on the mainframe. This capability makes users more productive by freeing them from DP department schedules and constraints, yet the DP department still controls the security of

sensitive information. Managers must no longer stop work when the mainframe becomes tied up with processing huge amounts of corporate financial data at the end of a quarter or fiscal year, for example.

Another important benefit of microcomputers in the mainframe world involves decision implementation. Traditionally, microcomputers have been used for decision analysis. As software products are developed in the future that allow nonprogrammers to create applications easily on microcomputers, they will be able to implement new systems for order entry and the like. Today, if a manager

in a large company decides a complex procedure must be implemented, the DP department may place the development task of that application on a waiting list for as long as two years before facilities become available to implement it.

But if a standard language such as Cobol is used on both microcomputers and mainframes and friendly human interfaces continue to evolve (allow-



The secret of Cobol's success lies in its file access methods; report generation; simple, powerful data manipulation; and its sort and merge capabilities.

ing nonprogrammers to generate standard Cobol procedures automatically), the user will be able to sit down at a microcomputer and design an application based on collected data. Then the user can transmit the procedural code to the DP department for integration into corporate MIS. As a result, the implementation wait time becomes much shorter.

Access to larger data areas

The introduction of the 33-bit address width on Cobol compilers for micros will enable users to access larger data areas. As an added advantage, having 33-bit addressing on a microcomputer will actually overcome one of the machine's drawbacks: Users will be able to read in multiple files and build up large data areas, as opposed to keeping data on a floppy disk.

In the other direction, developing debugged and tested applications on microcomputers, then uploading them to mainframes, once again frees expensive CPU time and allows the larger system to do what it does best. With Cobol on microcomputers, programmers can easily create or maintain standard Cobol applications.

Current micro-to-mainframe communications links do not address software compatibility. This is analogous to a person placing a telephone call to someone who speaks a different language. If one person is instructed in the other's language to go to a file cabinet, nothing will happen. Although a hardware link exists between the two, they simply do not understand each other.

Placing compatible language implementations on both the micro and the mainframe helps solve the language barrier that often relegates connected micros to the role of dumb terminals.

Using micros for development and maintenance of mainframe applications reduces costs and requires less time to complete a project because the machine is available for immediate programmer access. In contrast, intelligent terminals bear a comparable price tag to micros and may take up large amounts of expensive memory.

Micros that run Cobol also permit production of a greater volume of high-quality programs when companies can give each programmer a machine. This effectively eliminates any waiting either for a terminal to free up or for permission from the DP department to implement an application.

O'Grady is vice-president of strategic development at Micro Plans, Inc., a Palo Alto, Calif.-based developer of software productivity aids for micros.

for VM/CMS and MVS/TSO mainframe environments, in addition to optional APL Terminal Emulation.

She's got more to offer.

Other IRMA products give you more ways to build cost-effective IBM 3270 and IBM PC-based decision support networks.

IRMA^{LINE}™ is the first coaxial link between 3270 networks and remote personal computers, including the IBM PC/PC XT,

the Apple Lisa, the DEC Rainbow and others. IRMA^{LETTE}, the Asynchronous Interface, lets you run the same IRMA software in your remote personal computer that you run in the office.

So connect with success. With IRMA products from DCA. Call 1-800-241-IRMA.

Connect with success.

dca
Digital Communications Associates, Inc.

Networked DBMS: More than one plus one

By Gary Hunt
Special to C/W

Over the next few years, we will witness the proliferation of local-area networks tying microcomputers together in the office environment. Network users will not be able to depend on existing software written for single-

user personal computers. They will need software designed to take advantage of the kind of information sharing that is available through networking.

No single product exemplifies information sharing or brings out the potential of networking better than does

the data base management system (DBMS). Most existing microcomputer DBMS software, however, has been written with the sole user in mind. In a multiuser environment, single-user systems can have glaring and dangerous deficiencies.

Single-user software often

does not have the multiple access concurrency protection essential for multiuser network situations. Nor does it have security and privacy features and performance and capacity capabilities required by large business networks.

Software used in network

environments must provide data integrity when two people access information simultaneously. This is known as concurrent access protection.

Today, hardware networks for personal computers provide tools to help applications software companies handle concurrency. Some networks also provide file-locking and record-locking tools. However, these tools are not triggered automatically. Software such as DBMS should take advantage of them, but most do not.

Record lockout protects two users from modifying the same record in the data base at the same time. Yet it allows several users to modify different records simultaneously in the data base.

In network situations, because one user often modifies information that affects another, the information must always be accurate and up to date. Record locking is the only means of safeguarding data shared over a network and is the single most important requirement for local-area network data bases.

With a network environment and hard disk storage, security is not simple. Password protection must be provided, backed up by a second line of internal, tamper-proof security. But passwords alone provide only a flat security system — once you know the password, all data base information is available to you. This is why more sophisticated minicomputer and mainframe systems provide security rings, or classes, where different users can be authorized for different access. Instead of allowing equal access, these systems offer a hierarchy of access.

Security classes

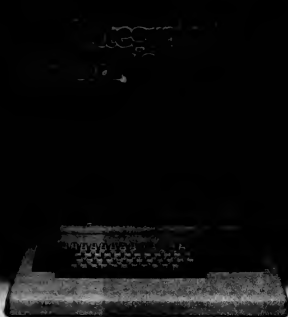
Security classes allow multiple levels of security. Both field-level and record-level security are needed. Field-level security allows certain fields to be restricted or unavailable to certain users. Record-level security allows access to certain records to be withheld from certain users.

In addition, if suspicious data is found, there must be a means to track any change to a record. These tracking systems are known as audits and can track who made the last change to a record and when.

Finally, flexibility and upgrade capability features should be included in a network DBMS. Should a user's needs change or expand, the DBMS must be able to change to accommodate the growth.

Knot is product marketing manager at Software Connections, Inc., a Santa Clara, Calif., vendor of local-area network software.

More versatility than ever with Lee Data's 3270 terminal system



Lee Data's new Personal Workstation now lets you enjoy all the advantages of professional business computing plus have both 3270 and asynchronous access to CPU-based applications—all from the same Lee Data workstation!

That's right! Completely integrated, IBM-compatible personal computing — offering the latest functional capabilities and these value-added features:

Support for a wide variety of popular applications, including all compatible IBM Personal Computer software.

Personal Workstation-based file transfer capabilities that allow transfer of data from CPU-based files through existing system communications net-

works, meaning no new communications networks are ever required.

A single board design that incorporates both display station and printer support, as well as 128K of random access memory standard—with up to 256K of expanded memory on the same board. Plus a dual diskette drive feature that offers two 5¼-inch floppy diskettes, each with 320K of storage capacity!

And four standard system expansion slots for add-on requirements as your needs change.

3270 and asynchronous application access and more personal computing, too—all part of an advanced system design by Lee Data.

Let us show you how easily personal computing can become a part of your company's terminal system.

Call our system specialists toll free:
800/328-3998

Designers of innovative systems
for the information worker

**LEE DATA
CORPORATION**

7075 Flying Cloud Drive
Minneapolis, MN 55344

Micro software on mainframe widens choice

By Helen Cusumano
Special to CW

The electronic spreadsheet revolutionized the microcomputer industry. Now another revolution, this time in the corporate mainframe environment, is being created by the electronic spreadsheet.

Many spreadsheet users in corporations have taken the power of microcomputer hardware to the limit. These users have developed large or sophisticated spreadsheet models that are limited by the personal computer's speed and memory capabilities; corporations are now looking to take advantage of the mainframe power already available within their corporations.

The same features that made personal computers an enormous success can now be translated into the mainframe environment. A different kind of software product is making available for mainframe users all the features of spreadsheets while at the same time using the larger main memory, faster data extraction, computing capabilities and advanced consolidation features of the mainframe.

Choice for users expanded

Micro-style software available both on the personal computer and on the mainframe widens the choices for users. Faced with a decision between the micro and the mainframe, users can choose the best of both worlds. They can continue to utilize the microcomputer for smaller spreadsheet applications while taking advantage of the software power of packages that can upload and download models to the mainframe.

From the corporate perspective, the combination of mainframe spreadsheets and software links to personal computers offers a number of advantages. First, corporate personal computer users can continue to request more information from the data base to fill their spreadsheets. This has already become a critical need in places where users began with the personal computer concept and are now spending valuable time typing in data to fill or update their spreadsheets. This is especially counterproductive and time-consuming, since the data already exists on their mainframes.

Second, the programming load for the MIS director and staff can be reduced by having the user manipulate user-friendly software without the need for programming expertise or applications programmers.

One of the problems with current links is that they are extremely limited in their uses and applications. For example, some products require additional hardware and software on both the mainframe and the micro.

Besides the software solution to the micro-mainframe links, there are hardware alternatives. But hardware developments remain extremely complex. There are no real standards in the computer industry today for these communications systems.

In the future, it will be much easier to exchange data from one computer to another. The breakup of AT&T may result in the development of many new options for data communications. In the longer term, MIS directors will find both software and

hardware solutions for intercomputer communications that will operate with the simplicity of plugging in a telephone.

Another major factor in simplifying communications will be the entry of the IBM 3270 Personal Computer and the Personal Computer XT 270. The major advantage of these systems will be the ability to integrate the strategies of the microcomputer and the mainframe. The new computer will run much of the software written for the IBM Personal Computer while at the same time accessing data generated by IBM's 4300 and 3090 series mainframes.

The impact of combining the strengths of the micro and the mainframe will depend on several factors. The MIS director has extensive experience in the management of the mainframe. However, micro usage in corporations raises a number of questions over control of both the equipment and the data. These machines differ from either terminals or dedicated word processing machines, and they require a different management style to deal with a new group of personal computer users.

Networking technology, where a number of computers or terminals are linked, is rapidly improving for

both micro and mainframe users. However, this technology is advancing independently for micro and for mainframes. The ultimate success of networking for corporations will probably depend on the ability of the MIS director to control the use of this technology and to integrate it into the corporate environment. The new generation of personal computers, such as the 3270 Personal Computer, can lead the way in bridging the gap between these two environments.

Cusumano is vice-president of operations for the Mega Group, an Irvine, Calif.-based vendor of micro-to-mainframe products.

NEW SOFTWARE CONCEPT

**MAKES A PERSONAL COMPUTER
A FULL-SCREEN WORK STATION
TO YOUR MAINFRAME
WITHOUT ADDED COSTS AND HASSLES**

- NO BISYNC LINES
- NO SPECIAL EQUIPMENT
- NO TP MONITORS
- NO SYSTEMS PROGRAMMERS

**APPLICATION DEVELOPMENT IS EASIER, TOO, WITH
DATA INTERFACE SYSTEM 31
A TOTALLY NEW IDEA IN PC/MAINFRAME INTEGRATION, FROM
data interface systems corporation**

POWERFUL PORTABLE PC WORK STATION	MAINFRAME APPLICATION DEVELOPMENT TOOL	LOW LINE, PHONE AND MODEM COSTS
Printer optional on each PC. Or one printer can support multiple PC's.	Friendly Interactive PC-based screen painter, links to host as needed to transmit or receive maps.	Save a bundle with dialup async (that's right) voice grade and an inexpensive modem.
No need to "configure" host.	Maps generated in minutes, ready for use.	Use it at your desk phone without waiting for installation.
Online or offline report browsing with "save" and "kill" options.	Program with 4 easy "call" functions.	Runs under any host's async foreground driver; TSO now, CMS soon. Can also be interfaced to CDC, Univac, DEC, HIS...
Powerful local field edits and built-in compression reduce transmission volume.	Standard COBOL for all other needs (including I/O) makes host applications portable between hosts.	No separate TP "monitor" required.
Move it to any phone.	Dial in to multiple hosts (including non-IBM).	Can also be run at a public data center.
Run full-screen or TTY.	No systems programmer needed, even for installation.	
SAVE ON EQUIPMENT	SAVE ON DEVELOPMENT	SAVE ON PROCESSING

For more information on product capabilities and support, call

512-346-5641

or send in the attached form to

data interface systems corporation

827 Harris Avenue, Austin, TX 78705

ATTN: Product Marketing

**ASK ABOUT OUR POST-INSTALLATION
SUPPORT AND WARRANTY, TOO.**

Please send me more information about DATA INTERFACE SYSTEM 31. My hardware and operating system are

Name

Title

Organization

Address

City, State, Zip

I'd ☐ do not ☐ want to

receive telephone followup at ☐

optional R2Phone 8

Abundant applications beguile new users

By Roger Thomas
Special to CWS

Microcomputers are just the tip of the iceberg. The proliferation of microcomputers in the business environment is being trailed closely by a proliferation of inexpensive packaged applications. The low purchase price of these applications hails the inexperienced computer user into a false sense of economy and security.

The first-time computer user still looks at a computer purchase decision as a hardware decision. The hardware configuration is determined, and the system is ordered. The budget typically only includes

Only when the realities of learning computer programming and operating system internals are discovered does the buyer begin a search for a package that someone else has written. The assumption then shifts from 'I am unique and need to develop my own applications' to 'I am really no different from any other company, so I can use someone else's package.'

the cost of the hardware. Software games are mastered is serious consideration given to the software decision. There are many reasons for

this. The hardware is more a toy than a serious business tool; most advertising and all of the media hype is directed toward hardware; the new user has dreams and ambitions of developing his own unique applications.

Only when the realities of learning computer programming and operating system internals are discovered does the buyer begin a search for a package that someone else has written. The assumption then shifts from "I am unique and need to develop my own applications" to "I am really no different from any other company, so I can use someone else's package."

Users are turning to packaged applications for microcomputers because:

- Users do not have the ability or the time to create good, well-documented or well-controlled applications.

- The user is more interested in developing special-purpose application packages that meet specific requirements.

- The user believes that it will take too long and cost too much money to have a centralized data processing department develop the application.

Most inexperienced microcomputer users believe that the \$300 to \$600 that they spend on an application package is the total cost. To find and install the correct package can cost a lot more. Other direct costs can include the cost of training, the cost of temporary help to cover for employees who will convert the data from the manual system to the computer system, the cost of the consultant or programmer to install the package and the cost of modifying the package.

Indirect application package costs include the management and clerical time spent determining needs, finding package vendors and evaluating packages and management time spent overseeing the package installation.

However, the biggest cost is the cost associated with making a mistake by choosing the wrong package. If, after the package is installed, it is found that it is not able to process the volume, produce the information needed or is otherwise inadequate, the financial impact on the company can be considerable. Not only does the company need to pay for another package, but it has to go through the search, selection and installation activities again. This can cost the company thousands of dollars and can turn company employees against the computer.

But is custom development the answer for microcomputer users? The answer is the same as for larger computer systems. Custom development is only feasible if a prepackaged application is not readily available that meets most of the desires of the company and, with modifications, requires less time and money than custom programming.

The decision whether to buy a packaged application or to develop

See PROGRAMS SR/72

Introducing the new NCR COM Systems

Designed for people who thought they couldn't afford high-speed computer output.

A state-of-the-art COM system is now within your budget. And more than that, when you select the NCR 5310 or 5320, you'll enjoy the latest technology and the best value in COM systems.

Controlled by the versatile NCR Personal Computer, these two COM systems offer the most cost-effective methods of producing microfiche today.

Of course that NCR PC is only one of the reasons these COM

systems are among the most advanced in the industry. For further proof, take a look at the other features you can have working for you:

- wet or dry film processing
- highly sophisticated camera system
- self-loading streaming tape drive
- optional console printer
- job statistics
- detailed diagnostics
- upgradeable to NCR minicomputer COM systems

Learn more about the affordable COM systems: the 5310 and 5320. Call or write NCR Micrographic Systems Division, 520 Logans Ave., Dept. 1650, Mountainview, CA 94043. 1-800-227-9964.



1954-1984
Celebrating the future



Barnes is director of management services for Moss Adams, certified public accountants in San Francisco.

See COBOL.

Dick is a COBOL programmer. Dick is bored. Harried. Dick struggles with trace and debugging routines. Nonexistent documentation. Mainframe logjams. So Dick is four months behind schedule. And users are upset about turnaround times. They yell and make Dick upset. They make Dick's boss upset. Nobody is very happy.



See COBOL Run.

Jane is a happy COBOL programmer. She uses ANIMATOR.* It's a VISUAL PROGRAMMING* aid for MICRO FOCUS* LEVEL II COBOL.* It runs on a micro. It makes child's play of mainframe test and maintenance chores.

With ANIMATOR Jane sees a picture of the program explaining itself. In live action. In real time. In COBOL source code. ANIMATOR tracks the program's exact execution path. Including subroutine branches.

Jane can have the program run fast. Or slow. Or stop. With one key. This makes it easy to spot problems. Insert fixes. Set breakpoints. Instantly.

Jane's programs sometimes win awards. Yet she always meets schedules. Jane's boss likes this about Jane. Because he doesn't like users to yell at him.

Run, COBOL, Run.

This DP manager got a bonus. Because he doubled productivity. Cleared backlogs. Cut costs. Boosted morale. Produced terrific applications. Quickly. Put control and prestige back into the central DP function. And nobody yells at him anymore. All thanks to ANIMATOR.

See ANIMATOR now.

Let Micro Focus put your DP shop on the fast track.

ANIMATOR runs with MICRO FOCUS LEVEL II COBOL for compatibility with ANSI '74 High Level COBOL implementations. A mainframe-micro communications link is recommended for downloading mainframe programs.



Write for more information.
Or call (415) 856-4161. Right now.

MICRO FOCUS*

2465 East Bayshore Rd., Suite 400, Palo Alto, CA 94303

I'd like more information

Name _____ Title _____
Company _____ Phone _____
Address _____
City _____ State _____ Zip _____

© 1984 Micro Focus Inc. All Rights Reserved.

LEVEL II COBOL, ANIMATOR, VISUAL PROGRAMMING, MICRO FOCUS and the MICRO FOCUS logo are trademarks of Micro Focus Ltd.

CH-416

SPECIAL REPORT

PACKAGE

from page SR/70

one in-house is the same for a microcomputer installation as for a mainframe installation, except the cost scale is different. The steps include:

- Determine user requirements.
- Determine which features the user must have or can compromise on or will accept as is.
- Locate and evaluate packaged applications.

■ Determine the level of modifications required, calculate the total cost and time to develop in-house, and compare it to the total package cost.

There is still a risk associated with purchasing prepackaged applications for a microcomputer.

Compared with the game or spreadsheet market, business applications did not reap large financial rewards for their developers. Consequently, the first generation of microcomputer business packages was very simple, easy to use, inflexible and, in general, lacked the good accounting controls inherent in larger computer systems.

However, during the past year or two, more accounting packages have become available. Some of these were developed from scratch, and some of them were scale-downs of previous minicomputer packages. The new generation is generally more complex, more flexible, has better accounting controls and requires more effort to install. These packages do not require the level of modifications to meet the desires of the sophisticated user.

This has two implications for the first-time computer user. First, with the diversity of packages available, the user has more to choose from and has a better chance of finding a package that comes close to satisfying his needs. This means, however, that the user has to spend much more time and effort in identifying needs and evaluating packages.

Secondly, with the availability of more packages and the increased chances of finding one that fits, the cost of custom development becomes totally prohibitive.

The rapid development of preprogrammed accounting packages for microcomputers has caused other problems within the industry. Programmers inexperienced in accounting have developed accounting packages that do not meet the generally accepted accounting principles inherent in older generation minicomputer packages.

A lot of these package developers are small start-up companies that, like the hardware companies, are poorly capitalized, underexperienced and may not be in business in the next couple of months. There are also a lot of problems with the quality of documentation available with the packages. In the rush to get the package on the market, the quality of documentation is compromised.

Another major danger associated with microcomputer application packages involves the behind-the-screen operation of the package. A review of the documentation, screens and menus may not uncover all of the areas in which the package is deficient. For example, a package may not require printing audit reports or may not require accounts to balance before posting to the general ledger.

If a company is deciding whether to buy a package or custom develop an application, needs and priorities

As the number of microcomputers installed in the business environment grows, the number of packaged applications will also grow. Their quality will improve, and they will become more complex. Because of the low cost to buy and to modify these packages, it will be cost-prohibitive to custom develop anything except very special-purpose applications.

should be identified first. Part of the detailed analysis should be a listing of features required by the system. Each item on the feature list should be categorized as:

- Absolutely needed (no compromise).
- Desired, but will look at another

way of doing (compromise to a point).

- Will take what is there (compromise).

When reviewing the packaged applications, you have to determine the cost of modifications to the no-compromise items and the number of

compromises you need to make in order to install that package.

As users become more sophisticated in using the computer, the feature list will grow, and it is more likely that modifications will be required. Consequently, the package needs the capability of being modified by somebody other than the author. Sometimes the source code is available from the developer so that in-house modifications can be made.

As the number of microcomputers installed in the business environment grows, the number of packaged applications will also grow. Their quality will improve, and they will become more complex. Because of the low cost to buy and to modify these packages, it will be cost-prohibitive to custom develop anything except very special-purpose applications.

SPECIAL REPORT

Corning handles micro installation like glass

CORNING, N.Y. — Corning Glass Works is a billion-dollar manufacturer of glass and other specialty products. With over 50 plants worldwide manufacturing more than 50,000 products, Corning operates an extensive network of IBM, Digital Equipment Corp. and other computers, most of which tie in to corporate headquarters here.

Because of Corning's large population of technologically oriented employees, microcomputers as a concept did not have to be sold. With the relatively low cost of micros and Corning's decentralized decision-making structure, many line and staff groups

already had or were planning to obtain micros on their own in 1983.

John Parker, director of Corning's Information Services Division (ISD), took the position that ISD would actively promote the use of micros by providing services to assist end users in the selection of appropriate hardware and software and to support their effective use.

Micros therefore became part of the full range of productivity tools supported by ISD, along with traditional structured applications, mainframe-based end-user computing, office systems and advanced telecommunications services, such as

a voice message system.

ISD's information center was a natural place to locate the initial microcomputer support team, since that group had experience in working with end users and had been successful in supporting the rapidly growing use of mainframe-based computing tools. In the span of about two years, the information center had guided the growth of mainframe end-user computing to approximately 1,000 employees at over 30 Corning sites in the U.S. and Canada, all with access to Corning's corporate data network. Over \$1 million in direct annual savings had been identified by both line

and staff organizations through use of information center services.

Corning's information center support approach is one of advising, teaching and coaching the end users in order to make them self-sufficient. The information center staff acts as facilitators who make it easier for the end users to get the computing power that they need.

The information center's experience with mainframe computing pointed out several implications for supporting microcomputer usage. First, ease of use was vital; complex commands and traditional programming were out. End users had to be able to insert a diskette, turn on power and see their application menu. Second, ISD had to provide classes covering the full spectrum from introductory through advanced instruction. Classes had to be hands-on, short and conveniently scheduled to provide the maximum benefit to the end users. Third, knowledgeable support people had to be accessible to the end users on a 100% basis and no more than a telephone call away. ISD's information center hotline was already in use, handling several hundred calls a month and was upgraded to support the new microcomputer users as well.

One of the first steps was to put together a set of guidelines for desktop microcomputer use. ISD wanted to steer people away from obsolete technology, but in keeping with the decentralization direction, guidance was oriented toward recommending and offering support.

The guidelines targeted managers who would make the decisions about acquisition and use of microcomputers in their departments, but who were not familiar with the technology and the implications of expanded microcomputer use. The guidelines included a statement of long-term direction, listed support services that ISD would provide and outlined end-user responsibilities.

In addition, the microcomputer guidelines contained a section on recommended hardware and software selections that ISD would support. The end users had to make the final purchase decision and had to obtain funding, but the guidelines provided some baseline guidance.

The choice of hardware and software to be supported was based on long-term considerations, such as integration with other ISD services, vendor viability and ease of use. The hardware decision to support the IBM Personal Computer and Personal Computer XT was easy, since Corning's corporate data network is based on IBM mainframes and Systems Network Architecture.

Although most Personal Computer usage initially would be on a stand-alone basis, access via the network to mainframe services and other Personal Computers would become necessary as the population grew. With IBM setting a course that would merge its Personal Computer and terminal product lines, the Personal Computer was viewed as a way to get immediate function while preserving the option of using it as an intelligent terminal in the future.

However, Corning does not use only IBM hardware. There are a large

See CORNING B1/74

MultiMate
MS-DOS
GW BASIC

Without software you're nowhere.

That's why the Corona PC runs virtually everything. Word Star® dBASE II® Lotus 1-2-3®. Thousands of packages in all. But we didn't stop there.

We give you 60% better graphics than IBM® (640x325 pixels). So your pictures look sharper. We doubled the memory: 128K, memory expandable to 512K.

We gave you a hard disk. And we bundle software. For instance,

SPECIAL REPORT

CORNING from SR/73

number of Digital Equipment Corp. minicomputers in plants and engineering areas, and it was anticipated that those areas could potentially make better use of DEC micros if software became available. ISD felt that the key was to support the software function, no matter what brand of hardware was used. For example, ISD now supports Lotus Development Corp.'s Lotus 1-2-3 on IBM Personal Computers, DEC Rainbows and Compaq Computer Corp. Compaq micros because the function is the same, regardless of the differing keyboards, monitors and other equipment.

After publishing and distributing the guidelines, ISD and the Corporate Purchasing Department negotiated volume discount contracts for IBM Personal Computers and Lotus 1-2-3 software.

Despite the occasional delays due to hardware availability problems, Corning has installed approximately 200 desktop computers in production, engineering, accounting, customer service, sales and many other areas.

Classes for personal computing topics are now booked well in advance, with over 300 Corning employees having attended the classes since they were started last fall.

The microcomputer classes have been packaged as a road show that has traveled to several manufacturing facilities in neighboring states. Several support people and a station wagon full of equipment and educational materials go to a plant for several days of classes on-site. This method of delivering intensive education not only makes it available to more people in a cost-effective way, it also allows the ISD microcomputer support team to get closer to clients.

Overall microcomputer usage is still in the embryonic stage. However, Corning is starting to see some beneficial applications.

The quality control group at one plant uses an IBM Personal Computer and Lotus 1-2-3 to track product reject rates for several machines by type of defect. Group members track history by machine and have access to daily, weekly, monthly and year-to-historical data. This application replaces stacks of paper quality control reports that could not be analyzed quickly enough.

Another division is equipping its sales personnel with Compaq portable computers, with product catalog information contained in a Lotus 1-2-3 spreadsheet. The sales force uses the communications capability of the computer to send order information to the mainframe-based order entry system and to receive reports in the field on particular customer needs.

Corporate financial staff at Corning headquarters use IBM Personal Computers to communicate with banks to analyze bank balances and to manage Corning's cash position on a daily basis.

The corporate controller's staff has a number of IBM Personal Computers used for financial analyses. Models of the impact of reorganizations and business restructuring are used to provide input to top corporate executives to aid in decision making.

An engineering project group used an IBM Personal Computer and Lotus 1-2-3 to collect data on various chemical compositions for a specific glass. This data is used to build models that

predict the effects of changing proportions of the mix. Once, when production data did not agree with the model's projections, an investigation discovered contaminated material in storage bins. The plant now plans to

corp's Visi-File to maintain a data base for a scholarship program for the children of deceased employees.

The Patent Department uses an IBM Personal Computer XT and custom software to maintain a data base

The guidelines targeted managers who would make the decisions about acquisition and use of microcomputers in their departments, but who were not familiar with the technology and the implications of expanded microcomputer use.

extend the application by interfacing directly to process control computers.

The Personnel Division uses an IBM Personal Computer and Visi-

of patents and trademarks. This data base is used to track the progress of applications in various countries and the status of any associated legal proceedings. The equipment is also

used to access commercial data bases of related patent information.

On Jan. 1, ISD's information center and the Office Systems Development groups were merged to form the Professional and Office Systems Department. This consolidated group will now be able to support Corning's business and professional work force with a wider range of services. In addition to ongoing current support services, implementation is under way for improved networking facilities via IBM's Elnet product. IBM's DIA/DCA standard is viewed as the glue to provide the future growth and interconnection of a wide range of services and devices. This year should see the continuation of the growth trend of the past three years toward direct end-user access in information-technology-based services.

DayFlo announces a major revision of the fundamental law of computing.



Micros ax turnaround time for forest service

VICTORIA, B.C. — When you're deep in the forest, it's nice to have an ax around. But if you're there working for the Ministry of Forests, sometimes what you want is a personal computer that hooks into the mainframe back at headquarters.

One organization that solved the problem of integrating its personal computers into its mainframe data base operation is the Ministry of Forests in British Columbia, Canada. The department employs over 8,000 people in 60 field offices scattered across the mountainous expanses of British Columbia. Telephones and teleprocessing are the main methods of com-

municating among these offices, especially among those in remote areas.

At its headquarters here, the Ministry of Forests has two IBM 3081 mainframes operating under MVS (J/RS) with TSO and OS/2 software, Inc.'s OS/2 Wybur. Personal computers — about 100 Wang Laboratories, Inc. Personal Computers and 40 IBM Personal Computers — have been installed in all offices.

"We needed to make these personal computers a part of the mainframe data base operation," stated Ramsey Miller, senior systems analyst for the ministry.

The ministry uses Wybur on

about 80% of its mainframe on-line interaction, and nearly 900 users in the organization are familiar with the product.

For its personal computers at headquarters and in the field, the ministry obtained the Wybur/PC package from OS/2 Software to enable its users and programmers to work on the personal computers in a mainframe-oriented environment. Wybur/PC provides a data base development environment that includes micro-to-mainframe communications, a full screen editor, screen panel formatting, file handling capabilities and a RUN command.

The ministry employs some 30 operators in its mainframe entry shop. Miller expects that the new decentralized system will eliminate most of the need for data entry at the mainframe. Additionally, because of slow delivery times, typically two weeks — local input and editing on the personal computers have already improved the turnaround time for many applications from four to six weeks to just one.

Before implementing the Wybur/PC software system, some of the ministry's remote sites were spending their entire DP budget on a few months' data entry. Now that the new system has taken many routine jobs down to the personal computers, more time and budget are available on the mainframe for the kind of interactive reporting that was cost-prohibitive before implementing the personal computer-based distributed processing environment.

Billing process sped

The system has enabled the Ministry of Forests to eliminate many billing and accounting problems associated with timber cutting. Before, when timber was cut for market, each local office completed forms and sent them to headquarters by mail. Delivery took two weeks, and if there were errors in the forms, the entire process had to be repeated. This lengthy process delayed billing and, subsequently, cash flow as well. If audits were needed or questions arose, it was frequently too late to do anything about them.

"In the past, the timber would already be aboard ship and on its way to Japan before the billing was done," Miller explained.

Workers in the field now record scaling and measurement data on handheld recorders as the timber is cut. They then plug the recorder into a port in the back of the personal computer to dump the information and then sort and edit it.

"Now our foresters do their work locally on the personal computer and use their mainframe time for communications," Miller said. He estimated that turnaround time on timber billing has been reduced by at least six to eight weeks and expects the improved cash flow to be worth millions to the ministry.

Work is also under way to build a data base to track the history of tree plantings and cuttings. The Ministry of Forests will be able to track more closely the progress of plantings and will be better able to forecast future logging potential.

Miller reported that Wybur/PC has provided him and his programmers with a menu-based system for building screens and screens. "The screen is the end user's contact with the corporate data flow. An efficient screen is simple and provides an easy path for the eye to follow. It is aesthetic and approachable," he added.

"Now we can make a screen look exactly as the user wants it — and be able to get it done quickly," he said. "Ideally, you want to be able to program as fast as you can think. The response time of a personal computer is two to three times quicker than that of a mainframe. It's unusual to work with something that fast," Miller said.

Garbage in, garbage out.

Since computers were invented, the conventional wisdom has held that input that doesn't conform to the computer's highly structured needs will result in unintelligible output.

Which meant that you had to learn to think like a computer in order to use one.

Trouble is, the world isn't organized to suit computers. Data is never collected in the way you want to retrieve it. That's why traditional, rigidly structured databases often wind up hindering your work more than they help.

DayFlo offers a new approach to database management needs. It's a Fluid Format™ Personal Information Manager. Which means it approaches the world the same way you do: taking in unorganized data and organizing it into meaningful information.

DayFlo is a powerful tool for your IBM® PC XT. It accepts both structured and unstructured data. When you want to extract information, just type in the key words you're looking for. Instantly, DayFlo organizes the data according to your criteria. And reorganizes it according to new criteria whenever you wish.

Information from other programs, spreadsheets, word processing or accounting files, virtually any data in the system can be assimilated by DayFlo. And once the information is at hand, DayFlo lets you manipulate it at will to produce letters, memos, reports and much more. You can work at your computer the same way you work at your desk, even switching quickly from task to task, without ever losing your place.

DayFlo's concept is as simple as it is revolutionary. You no longer have to think for the computer. Instead, it can help you think better for yourself. Which leads, inevitably, to a brand-new version of computing's fundamental law.

DAYFLO
Software

Garbage in. Information out.

DayFlo, Inc., 2000 Mitchell Dr., Bldg. 400, Irvine, CA 92715 Call Now: (800) 720-7150 (Outside CA), (800) 620-7150 (CA Only)
DayFlo and Fluid Format are trademarks of DayFlo, Inc. © 1983 DayFlo, Inc.



Two personal computers that are great for business



If you're looking for a personal computer for your company, Continental Resources offers you two of the best: The **IBM Personal Computer XT*** and The **Digital Equipment Rainbow 100+****.

The **IBM PC XT** is a high-performance system made even better with Continental's value-added graphics options. The **IBM PC XT** features 128K RAM (expandable to 640K), a 360K 5 1/4" diskette drive, a

10-megabyte fixed disk drive for fast, reliable data storage and retrieval, a high-speed 16-bit microprocessor, full-featured keyboard, and the expansion capability to meet nearly every need.

Digital Equipment's Rainbow 100+ is an advanced system designed to run both 8 and 16-bit software. The **Rainbow 100+** features 128K RAM (expandable to 896K), 800K 5 1/4" diskette drive, a 10-megabyte fixed disk, 105-key keyboard, and the flexibility to grow as your business grows.

Selection. Support. Total Service. That's what you get when you buy from Continental.

Whether you need a dumb terminal, disk drive, high-speed line printer, or an advanced graphics system, we can deliver what you need. Products of almost every description from virtually every industry leader.

Not ready to buy? Continental offers a host of rental or leasing options—one is sure to meet your needs.

But Continental doesn't just offer great selection. We provide a total support package unmatched in the industry. All our offices provide sales, technical and service support backed by more than 20 years experience. You're assured of the most informative, professional assistance available—before and after your purchase. And Continental even supplies complete on-site service.

Not sure of what you need? Our specialists will evaluate your needs and recommend the right system for you. And that means software, too. And supplies like ribbons, printwheels, and paper—even complete workstations.

So give us a call the next time you need computer equipment. Continental Resources. We deliver what you need.

CONTINENTAL RESOURCES, INC.

We deliver what you need.



*IBM Personal Computer XT is a trademark of International Business Machines Corporation

**Rainbow 100+ is a trademark of Digital Equipment Corporation

***Lotus 1-2-3 is a trademark of Lotus Development Corporation

Free software offer valid for limited time only.

Corporate Headquarters
175 Middlesex Turnpike
Bedford, MA 01730

Boston Area
(617) 275-0850
Chicago Area
(312) 860-5991

New York NY
(212) 695-3206
Baltimore
Washington DC
(301) 948-4310

Northern NJ Area
(201) 654-8900
San Francisco Area
(408) 727-9670

Philadelphia Area
(609) 234-5100
Los Angeles Area
(213) 638-0454

WE ALSO OFFER

1. **FREE Lotus 1-2-3***** with purchase of either of these fine computers!
2. Letter-quality printers from Genicom, Digital Equipment, Diablo, and NEC!
3. Rental, leasing, and purchase plans for every need!

CALL FOR DETAILS

SYSTEMS & PERIPHERALS

Harris makes low-end addition to 32-bit line Harris 60 supports office, doesn't require raised floor

PORT LAUDERDALE, Fla. — Harris Corp. today unveiled its first system that does not have to be used in a raised-floor computer room. Called the Harris 60, the low-end addition to the firm's line of 32-bit superminicomputers was reportedly designed for office or departmental use. The firm has targeted computer-aided engineering and office automation applications as typical uses of the system.

Said to offer internal performance of slightly less than 1 million instructions per second, the Harris 60 is packaged in a desk-high cabinet and can use standard office electrical power. A basic configuration consists of a two-board CPU; a communications controller that can accommodate up to 16 lines; an 80M-byte, 14-in. Winchester disk drive; a 239M-byte, 14-in. cartridge tape drive and an operator communications terminal as a console; and the firm's VOS operating system. The unit employs 256K-bit memory chips to achieve a main memory capacity ranging from 768K to 12M bytes.

In addition, the Harris 60 features an optional 6K-byte cache memory that is said to improve internal throughput by approximately 30%. An optional floating-point processor, called an Integrated Scientific Arithmetic Unit, is said to provide up to 60% greater performance in floating-point operations over conventional software routines. The floating-point processor employs very large-scale integration technology and custom gate array circuits, the firm said.

A board-level integrated disk controller and I/O channel support a total of four



The Harris 60 superminicomputer

80M-, 160M- or 474M-byte disk drives in any combination. This, Harris said, gives the Harris 60 a maximum disk storage capacity of 1.8G bytes.

The Harris 60 was designed to use the firm's VOS operating system, which provides a virtual address space up to 48M bytes. The newly announced system is said to be both hardware- and software-compatible with other processors in the Harris line.

The Harris 60 is said to handle multiuser applications for distributed processing, DP, engineering workstations and office automation applications. The system can support up to 32 interactive users and is capable of performing design support, computer-aided design and software de-

velopment applications at the same time.

In a computer-aided engineering application, the Harris 60 is said to support multiple graphics display systems and other design peripherals. In addition, the Harris 60 can use several third-party software packages geared to computer-aided engineering applications. These include: Aivil 4000 by Manufacturing and Consulting Services, Inc.; Ansys by Swanson Analysis Systems, Inc.; Nisa by Engineering Mechanics Research Corp.; and Patran-G by PDA Engineering, Inc. A Harris spokesman added that applications developed on the Harris 60 can also be used on larger Harris 32-bit superminicomputers, thus offering the entry-level user an upgrade path.

In an office automation environment, the Harris 60 is said to be capable of simultaneously supporting DP and other functions like word processing or engineering duties. Several third-party office automation software packages are supported on the Harris 60. These include: Oracle Corp.'s Oracle data base management package; Rencore Software, Inc.'s Info relational data base management system; IFRS, an interactive financial planning package developed for Harris by Execucom Systems, Inc.; and Mosa, a word processing package developed by Marc Software, Inc., a spokesman said.

First shipments of the Harris 60 will begin in June. A basic configuration costs \$40,600. The optional floating-point processor costs \$10,000, and the cache memory option costs \$35,000. Harris is located at 2101 W. Cypress Creek Road, Port Lauderdale, Fla. 33309.

■ A VAX-based turnkey system is unveiled for nuclear and non-nuclear power facilities/82

INSIDE

Turnkey Systems/82
Terminals/84
Printers/Plotters/86
Graphics Systems/88
Power Supplies/88
Board-Level Devices/87
Auxiliary Equipment/88

Multiuser small business system uses diskettes

CULVER CITY, Calif. — Bexon Business Machines Corp. has announced a multiuser small business system that uses 8-in. diskettes rather than cartridge tape for backup.

The 16-bit EX50 supports from one to four users and is intended for applications that have minimal backup requirements, Bexon said. It reportedly uses Binary Synchronous Communications protocols to link remote EX50s to other Bexon systems and is compatible with IBM 2780/3780 protocols.

A typical EX50 configuration may include 10M to 16M bytes of Winchester disk storage, 128K to 256K bytes of memory, four serial ports and two parallel ports, according to the vendor. It also features an 8-in. diskette unit that accommodates 1.2M-byte, double-sided, double-density diskettes and single-sided, single-density diskettes.

According to the company, the EX50 is software compatible with other Bexon systems, including the EX100, EX200 and EX400, and runs software based on Bex-

on's Bexop operating system. That software includes data base management, word processing, accounting and medical information system packages. The EX50 also supports the Digital Research, Inc. CP/M-86 operating system, according to Bexon.

The 10M-byte, 128K central station system is priced at \$7,250. Deliveries are scheduled for May.

Bexon Business Machines is located at 5800 Upslander Way, Culver City, Calif. 90230.

Tape subsystem fits VAX, PDP

WESTMONT, Ill. — First Computer Corp. released a tape subsystem designed for Digital Equipment Corp. VAX-11 and large PDP-11 series processors.

The Phase Encoded/Group Coded Recording Tape Subsystem can provide up to 180M bytes of backup storage. It is equipped with autothreading and features dual-density, 50 in./sec start/stop tape with tape transport, formatter/controller, power supply and resident microdiagnostics.

Available now, it is priced at \$40,000. Quantity discounts are available.

First Computer is located at 845 Blackhawk Drive, Westmont, Ill. 60090.

Alterable logic array offered

SAN JOSE, Calif. — Semi Processes, Inc. has announced the development of what it claims is the first electrically alterable programmable logic array (E2PLA).

The cell is a double-diffused metal oxide semiconductor and, according to the company, performs a thinking function that manipulates what is stored in memory.

The vendor said that the E2PLA will allow design engineers to program, erase and reprogram during the design phase of a project and then use hardware or electrically programmable chips for the final product.

The vendor cited robots, other high-

precision mechanical devices and military and space applications as other likely uses.

According to the company, the evaluation chip had 32 cells and was used for 10,000 write/erase cycles. The company claimed the low power needs of Gates will allow upgrading to 2,000 cells.

Semi Processes officials said the E2PLA could replace one-third of the existing bipolar market. Commercial versions will be available in the third or fourth quarter of 1984, according to the vendor.

More information is available from Semi Processes at 1971 N. Capital Ave., San Jose, Calif. 95132.

You are cordially invited to see
the fastest compilers for
MC68000/UNIX™

PHILON
FAST
COMPILERS

While you are
at Comdex
May 22-24, 1984

ESSEX A SUITE
HYATT REGENCY ATLANTA
PEACHTREE CENTER

Complimentary Refreshments 8:30am-8:30pm

Philon, Inc. • 50 Cooper Square • NY, NY 10003 • (212) 420-0517

UNIX is a trademark of Bell Laboratories.

**THE BEST WAY TO REACH MEN
WITH YOUR NETWORK BUDGET IS
TO SPEND PART OF IT ON
ESPN, THE TOTAL SPORTS NETWORK.**



THE TOTAL SPORTS NETWORK



SYSTEMS & PERIPHERALS

Impell turnkey targets CAD for power industry

SAN FRANCISCO — Impell Corp. has announced a turnkey system designed to perform computer-aided design (CAD) functions for the power industry.

The Cosmia/T uses Impell's Cosmia applications software and a Digital Equipment Corp. 32-bit VAX series superminicomputer to perform pipe stress calculation, process and instrumentation layout, pipe support analysis and design and general steel structural analysis and design, according to Impell.

The system was designed for use in nuclear and nonnuclear utilities and allows the user to create application data bases, move freely from design to analysis and prepare reports, the company said.

The basic configuration is a DEC VAX-11/730 superminicomputer, 121M-byte fixed disk drive, 10.4M-byte cartridge disk drive, 1,500 bit/in. tape drive, communications control, console, two black-and-white graphics terminals, one text terminal and optional plotter and printer.

In addition to the Impell applications software, Cosmia/T includes the Manufacturing & Consulting Services, Inc. Asvul-4000 graphics package, designed for use as a stand-alone CAD tool or in conjunction with the Cosmia/T applications programs to create a computer-aided engineering system.

A basic, two-station system is priced at \$200,000. Deliveries are scheduled for September, according to the vendor.

Impell is located at 220 Montgomery St., San Francisco, Calif. 94104.

TURNKEY SYSTEMS

GENERAL ELECTRIC CO. Scanvision

General Electric Co. has announced a vision system designed to measure, sort and inspect products such as metal and plastic parts and wire and filament in automotive, aerospace and other industrial applications.

Scanvision is said to perform dimensional analysis, object identification, part inspection and flaw detection.

The package includes a solid-state decision processor, a high-resolution line scan camera, standard optics and a standard display terminal.

According to GE, the Scanvision system is suited for nondestructive test and inspection tasks that don't require complex algorithm-based vision systems.

The off-the-shelf cameras are said to be capable of measuring dimensional characteristics to an accuracy of 0.1mm in a 100mm field of view.

System software includes a menu for program setup and on-line installation, while on-board memory can store up to eight programs allowing for rapid batch changeover in manufacturing environments, according to the company.

It uses a 16-bit microcomputer controller to perform linear scale analysis at up to 7,500 part/min. It features on-board diagnostics, serial I/O ports for integration with off-line plant computers, eight optically isolated output relays and three input program selector interrupts.

GE reported that Scanvision is especially useful for high-accuracy measurement of small, high-tolerance machine parts and for real-time measurement of web thickness and dimensional checking.

Scanvision is priced at approximately \$20,000.

GE, P.O. Box 5077, Clinton, N.J. 07015.

1982

STRATUS INTRODUCES THE WORLD'S FIRST HARDWARE-BASED FAULT-TOLERANT COMPUTERS.

1984

STRATUS INTRODUCES THE WORLD'S MOST POWERFUL FAULT-TOLERANT TRANSACTION PROCESSING COMPUTERS.

If You Need Transaction Processing, You Need to be Able to Count on it Every Second.

With the introduction of the new XA 400 and XA 600 Extended Architecture computers, Stratus can offer transaction processing power that goes beyond anything else available. This is great news in a world that is more dependent on transaction processing with each passing day. What makes it even better news (in a world where companies can lose thousands of dollars for every minute of downtime) is that it is fault tolerant transaction processing.

1982 is Compatible with 1984.

The original member of the Stratus/32 family, the FT 200, and the new XA 400 and XA 600 computers are completely program compatible. In addition, you can expand your Stratus/32 system by connecting together any combination of the three computers, creating a single system with up to 32 processors. With the use of our

StrataNET software, a network of over 65,000 processing modules can be joined together to provide a system that will work on thousands of transactions per second, with hardware based fault tolerant reliability.

Added Power, but No Added Effort for Programmers or Users.

One of the advantages of Stratus' hardware based approach to fault tolerance when it was introduced 2 years ago was that, unlike software based fault tolerant computers, it required no added attention from programmers or users. This is just as true now for the powerful new Stratus XA computers. Even the XA 400 with 4 parallel processors, and the XA 600 with 6 parallel processors, high speed cache memories, and additional hardware instructions require no more effort from developers and

users than the original Stratus/32.

1984, and Beyond.

The writing is on the wall. Transaction processing in increasing volume will be the order of the day. Meanwhile, hardware based fault tolerance that can deliver continuous processing without loss of performance is

already a necessity, rather than a luxury. No other computer is as prepared to prepare you for the demands of the times as is Stratus.



XA 400



XA 600

For more detailed information, please contact your local Stratus sales office, or call Keith Johnson in Massachusetts at (617) 653-1466, or toll-free at 1-800-255-1515.

Stratus
CONTINUOUS PROCESSING™

Now that the world relies on computers it needs a computer it can rely on.

SYSTEMS & PERIPHERALS

TERMINALS

AMTEL SYSTEMS CORP.
307 terminal

Amstel Systems Corp. has announced a terminal for its Messenger II automated message center system.

The 307 message entry terminal is designed for use in companies with high telephone traffic. It is said to allow the message center attendant to switch among the most commonly used message center functions, such as message entry, directory maintenance, party holding, directory display and user status.

According to the company, the 307 terminal increases performance by maintaining more functions in its private memory.

The terminal is priced at \$1,696. A software option, priced at \$1,000, is available for existing Messenger II users who wish to upgrade to the 307 terminal unit.

Amstel Systems, 1293 Arrowhead Ave., Sunnyvale, Calif. 94089.

COMPUTER
COMMUNICATIONS, INC.
8274 Remote Cluster Group

Computer Communications, Inc. (CCI) has introduced its 8274 Remote Cluster Group of IBM-compatible products for its Group 8000 family. The group consists of a remote cluster controller, the CCI 8287; a terminal, the CCI 8178; and a printer, the CCI 8287.

Among the features of the Remote

Cluster Group are support for up to 40 IBM 3178 displays and concurrent Ascl-to-IBM Synchronous Data Link Control protocol conversion for Ascl terminals and their IBM Personal Computer emulators.

The CCI 8178 terminal reportedly offers a 13-in. anti-glare monitor, displaying 24 lines by 80 char., and a detachable keyboard. It is said to connect to the CCI 8274C remote cluster controller via the firm's multiplexing protocol, Cabeltalk, and to be designed for use in place of the IBM 3178 display station.

The CCI 8287 printer, designed for use in place of the IBM 3287 Model 2, can reportedly be attached to either the CCI 8287 remote cluster controller or directly to a CCI 8178 display station.

A standard package of the 8274 Remote Cluster Group is priced at \$6,776, without terminals. With eight terminals, the package is priced at \$10,150.

Computer Communications, 2610 Columbia St., Torrance, Calif. 90503.

LINK TECHNOLOGIES, INC.
Smart Link 150

Link Technologies, Inc. has introduced an intelligent CRT terminal said to be compatible with the Televideo Systems, Inc. Model 950.

Called the Smart Link 150, the unit reportedly features a 13-in. monitor with a green or amber screen. It is code-compatible with the Televideo 950 and offers four pages of memory for use either as a 96-line page or as four independent pages.

Eleven user-programmable function keys with nonvolatile memory are standard.

Smart Link 150 also reportedly offers soft setup, full editing, protected fields, smooth or jump scroll, 16 bit/sec to 19.2 bit/sec transfer rates and business graphics.

It is priced at \$895.

Link Technologies, 1887 O'Toole Ave., Building C-108, San Jose, Calif. 95131.

INNOVATIVE ELECTRONICS,
INC.
MC-80/600-1

Innovative Electronics, Inc. has announced the MC-80/600-1 communications processor, which is said to be able to convert Digital Equipment Corp. VT100 or compatible terminals into full-function IBM 3277 Model 1, 3277 Model 2, 3278 Model 1 or 3278 Model 2 terminals communicating with an IBM host processor using the Binary Synchronous Communications protocol.

The device emulates an IBM 3274 Model 51C communications controller (support Level A). Asynchronous Ascl terminals can be used in both local and dial-up applications. Full screen mapping is performed by the product. Data displayed on the asynchronous Ascl terminal will reportedly be the same as an IBM 3277/3278 display station, with virtual screen sizes of 480, 960 and 1,920 char. All screen formatting capabilities are supported, the vendor said.

On-line and off-line diagnostics are provided through a seven-seg-

ment display. The stand-alone, micro communications processor provides up to 16K bytes of read-only memory, 16K bytes of random-access memory and two serial communications ports. The price is \$1,495.

Innovative Electronics, 4714 N.W. 155th St., Miami, Fla. 33014.

PRINTERS/PLOTTERS

CENTRONICS DATA COMPUTER
CORP.
Horizon series

Centronics Data Computer Corp. has announced its Horizon series of dot matrix printers, aimed at use with small systems and personal computers.

The printers feature built-in adjustable tracings, pin-addressable graphics in seven densities, downline loading of character sets, italics and resident international character sets.

The Model H30 features a type-writer-style font and can interface with most popular personal computers, according to a spokesman for the company.

It is said to allow an 8-in. print line and to offer 160 char./sec draft printing and 27 char./sec letter printing. Other features reportedly include enhanced overstrike, condensed pica and elite, expanded print modes and superscript/subscript printing. The Model H30 is priced at \$609, and general availability is scheduled for the third quarter of 1984.

PROJECT YOUR

Consider the advantage of our unique, single lens design over complicated 3-lens projectors.



SYSTEMS & PERIPHERALS

The Model H136 is said to feature a 15.6-in. print line capable of printing 146 char. at 10 char./in. in condensed print mode. It is said to print 386 char./line. The H136 prints 160 char./sec for data processing printing and 27 char./sec for letter printing.

General availability is expected in the third quarter. It is priced at \$899, the vendor said.

Centronics, 1 Wall St., Hudson, N.H. 03011.

NICOLET ZETA CORP. Zeta 995

Nicolet Zeta Corp. has announced an eight-pen, 34-in.-wide digital drum plotter for use in cartographic, architectural and engineering applications.

The Zeta 995 is said to offer high-resolution graphics for continuous feed and cut-sheet media allowing drawings up to 130 ft. in length. The plotter uses preformed forms, standard translucent paper, glossy bond, vellum and mylar.

According to the company, throughput is increased by use of eight capped pens in one microcomputer-controlled carriage rather than using a single-pen approach with extra pens stored on the side of the plotting surface. It also is said to have a standard liquid ink-pen cartridge providing the user with four-pen carriage-mounted liquid-ink capability.

It reportedly allows the user control over variables such as speed, pen pressure, acceleration and pen up/

down delay times. It offers switch-selectable resolution of 0.35mm and .001 in.

Available interfaces include RS-232 and IEEE 488.

List price for the plotter is \$15,900, with quantity discounts available.

Nicolet Zeta, P.O. Box 3030, Mer-Hous, Calif. 94553.

GRAPHICS SYSTEMS

EASTAR TECHNOLOGIES, INC. Model One/90-S

Raster Technologies, Inc. has introduced an enhanced version of its Model One/90 color graphics controller that reportedly offers features such as local hidden surface removal, local smooth shading, automatic pattern dithering and transparent surfaces.

The Model One/90-S graphics controller is an upwardly compatible extension of the Model One/90. The unit is said to support a dual-mode memory configuration that allows it to be used either as a high-resolution 1,280-pixel by 1,024-pixel system or as a medium-resolution 640-pixel by 512-pixel system for shaded image generation.

Using a local 16-bit Z-buffer for hidden surface removal, the Model One/90-S performs local bilinear shading interpolation on polygonal data from the host, according to a vendor spokesman.

The controller is priced at \$25,000.

Raster Technologies, 9 Executive Park Drive, North Billerica, Mass. 01863.

MEGATEK CORP.

Whisper 1600 enhancements

Megatek Corp. has announced a three-dimensional graphics capability for its Whisper 1600 desktop engineering terminals and mid-range 3365 graphics systems. The three-dimensional capacity previously had been available only on the firm's more expensive 7200 system.

The three-dimensional capability for the 3360 terminals comes in the form of an add-on, 52-bit, Megatek processor board, which does the calculations needed to produce three-dimensional graphics.

The 1600 terminals, according to the vendor, are now being provided with a three-dimensional graphics generating program embedded in read-only memory. The terminals are available in color or black-and-white.

Prices for the upgrade board for the firm's 3365 graphics systems range from \$3,000 to \$6,000. The 1600 terminal is priced at \$9,800, and the 1645 is priced at \$8,900. Megatek, 8005 Scranton Road, San Diego, Calif. 92121.

POWER SUPPLIES

TODD PRODUCTS CORP. MRX-400

Todd Products Corp. has announced a series of 400W, quad-output, open-frame switching power supplies for microprocessor-based computers, word processors and test equipment.

The MRX-400 series has a regulated 12V or 34V, 1.5A output for driving CRT displays. It also provides a 5V, 50A output and a choice of a $\pm 15V$ or $\pm 15V$, 10A output.

According to the vendor, the units feature a power density of 2.1W/cu. in. and occupy a 25-cu.-in. frame.

The choice of regulated 12V or 34V output is intended to assure a clear and stable presentation on the video terminal. The 5V output is available for powering logic, memory and interface circuits, and the choice of $\pm 15V$ and $\pm 15V$ outputs is intended to meet the needs of disk drives, printers and other peripherals.

The power supplies are available within 30 days of order at \$636. Quantity discounts are available.

Todd Products, 50 Empire Blvd., Brewster, N.Y. 11717.

LAMBDA ELECTRONICS MLGA

Lambda Electronics has announced a series of power supplies designed to meet military environmental specifications in accordance with military standard 883C.

The MLGA series reportedly features 21 models in four package sizes up to 150A and up to 28V. The series is said to have a regulation

Continued on page 87

TERMINAL

- Automatically converges colors today can work with so many computer terminals!
- Easy set-up in minutes by non-technical people.
- Only 3 operating controls.
- The only projection system that can handle virtually all data and video automatically.
- Brilliant color and sharp detail in normal lighting.
- Adjustable to flat or curved, front or rear screens.

- No other projection system today can work with so many computer terminals!
- The color projection choice of companies such as IBM, Dupont, Merrill Lynch and General Foods.



ELECTROHOME ELECTRONICS

Electrohome Limited, 899 Wellington Street North, Richman, Ontario, Canada M2S 4J8.
Telephone (518) 744-7111 Telex 039-55449

U.S. customers phone toll-free 1-800-265-2171

See us at: NCGA Booth 1806, COMDEX Booth 3816

- ☐ Please send me more information on the RCP 1000
☐ Please have a representative call
☐ I would like a demonstration.

Electrohome Limited
Advertising Department
P.O. Box 1663
Buffalo, New York 14203

Name _____
 Street _____
 City _____ State _____
 Zip Code _____ Phone _____

ELVCA-88

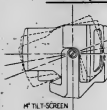


The TeleVideo 970. Nothing tops it for performance and design.

The TeleVideo 970. The world's most advanced ANSI video display terminal.

It's equipped with the ANSI X3.64 standard so nothing can top its communications capability. And clear ergonomic superiority means nothing can top the 970 for user comfort and enhanced productivity.

Unsurpassed Ergonomics



The 14-inch, non-glare screen tilts at a touch and displays up to 132 columns by 24 lines. There are

double high, double wide characters and an excellent selection of visual and graphic attributes. For an almost endless array of displays and forms.

The Power of ANSI

The 970 is compatible with the DEC VT-100/52 but offers more of the kind of power you'd expect to find at the top. Power that emanates from ANSI—the universal language of data management equipment.

Power that is more effectively directed by 16/32 programmable, non-volatile function keys, logical attributes, a 256 character downloadable soft font, and an

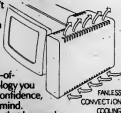
optional Tektronix 4010/4014 graphics board.

This is the one terminal that TeleVideo—and every other manufacturer—can't

top. Get a demonstration from one of our regional offices today.

The 970 promises state-of-the-art technology you can use with confidence, with peace of mind.

The promise that has made TeleVideo the number one independent terminal company in the world.



LOW RISK HIGH TECH

TeleVideo Terminals

● TeleVideo Systems, Inc.

California/Santa Ana
California/Sunnyvale
Georgia/Atlanta

(714) 476-0244
(408) 745-7760
(404) 447-1231

Illinois/Chicago
Massachusetts/Boston
New York/New York

(312) 397-5400
(617) 890-3282
(516) 496-4777

Texas/Dallas
Central Europe
Northern Europe

(214) 258-6776
(31) 2503-35444
(44) 9-905-6464

Southern Europe
DEC is a registered trademark of Digital
Equipment Corporation.

(33) 1-686-4412

SYSTEMS & PERIPHERALS

Continued from page 56

(line/second) of 0.1% and ripple of 10 mV on 5V and 4V models, and 15 mV on 11V to 20V models.

The power supplies are available now. Prices range from \$1,046 to \$1,710.

Lambda Electronics, 515 Broad Road, Roseland, N.J. 11474.

SEIKLAND SYSTEMS, INC.

Turn-On

Seikland Systems, Inc. has introduced a power controller reportedly designed to allow communications to remote, unattended, power-downed computer systems.

Turn-On will power a system during an incoming telephone call and leave the power on for the duration of the call, allowing the execution of file transfers, electronic mail and other user applications, a vendor spokesman said. Turn-On will power-down an unattended system when the phone call is completed. In addition, the power controller provides ac power surge protection, the spokesman said.

Turn-On is hardware-independent and reportedly will work with all communications programs and direct-connect modems that can operate unattended at the remote end. It requires that the system's remote devices be able to initialize and perform unattended access without manual intervention.

The power controller is available in two models: the Model 1001, priced at \$189 with basic power spike suppression; and the Model 1002, priced at \$219 with surge and transient suppression.

Seikland Systems, 160 Green Valley Road, Soos Valley, Calif. 95006.

COMPUTER POWER, INC.

UPS-45-1800M

Computer Power, Inc. has announced a 1,500V reverse transfer power system.

The uninterruptible power system, UPS-45-1800M, reportedly has no interruption during the transfer from utility power to battery operation upon ac failure. It will also serve as a line conditioner and provide isolation and filter against noise and fluctuations, a vendor spokesman said.

Standard runtime is 40 minutes, with longer or shorter times available. The cabinet can be mounted on the floor or wall, the spokesman said. The UPS-45-1800M is priced at \$3,500.

Computer Power, 124 W. Main St., High Bridge, N.J. 08520.

BOARD-LEVEL DEVICES

NORTHWEST DIGITAL SYSTEMS

Graphics-Plus

Northwest Digital Systems has announced an enhancement board that adds graphics capabilities to the Zenith Data Systems Corp. Z-19 terminal.

Graphics-Plus is said to provide graphics capability, different text formats and operator conveniences such as English-language menu setup and the ability to reprogram the Z-19 function keys.

The board reportedly allows the Zenith terminal to emulate the Tektronix, Inc. 4010 graphics display

terminal to be compatible with industry-standard graphics software and to emulate the Digital Equipment Corp. VT55 terminal and most features of the DEC VT100 terminal.

According to Northwest Digital, the text mode allows the user to select among four screen display formats: 132 col. by either 24 or 48 lines deep, or 80 col. by either 34 or 48 lines deep.

It also features seven pages of off-screen scrolling memory, according to the vendor.

The board is designed to be installed on-site by the user, the vendor said.

Graphics-Plus is priced at \$649, according to the vendor.

Northwest Digital Systems, P.O. Box 15586, Seattle, Wash. 98116.

See ENR page 58

You are cordially invited to see the fastest compilers for IBM/OS/UNIX™

PHILON
FAST
COMPILERS

While you are
at Comdex
May 22-24, 1984

ESSEX A SUITE
HYATT REGENCY ATLANTA
PEACHTREE CENTER

Complimentary Refreshments

8:30am-6:30pm

Philon, Inc. • 50 Cooper Square • NY, NY 10003 • (212) 420-0317

UNIX is a trademark of Bell Laboratories

In 6 hours you can protect your investment in software and enhance its capabilities

That's right. The software revolution is already here, and it's moving at full throttle. To keep you apprised of where it's going and how to get there before your competition does, Martin Marietta Data Systems is presenting "New Dimensions in Software: A Strategy for Managing Information". This informative seminar series will examine the trends, issues and emerging solutions that will greatly affect the way you conduct operations in the very near future.

Corporate data management, the micro-to-mainframe connection, PC proliferation in the corporate office, the application development decade, CPU utilization... each of these topics share one common characteristic: the need for a unified software solution.

Not as Simple as 1...2...3...

Today's corporate information needs can no longer be met piecemeal, with a software package here, a productivity tool there and everywhere a jargon of rival but incompatible data. A comprehensive software strategy is the new order. Based on corporate-wide perspectives and the harmonious interaction of all information systems.

Integration and the Martin Marietta Difference

Martin Marietta's commitment to software technology speaks for itself: From our MAS family of high-performance

application software packages... to RAMIS® II, the world's leading fourth-generation language and foundation for the most advanced line of productivity and systems software available anywhere... to the ITSoftware series of personal computer programs for transforming your desktop computer into a total information center. Plus an expertise in custom-built systems based on real-world experience.

We invite you to explore our New Dimensions in Software during this seminar series. Two distinct sessions will be held: Seminar A for corporate executives and vice presidents of manufacturing, MIS, and finance; and Seminar B for data processing executives and management. Attendance is free. And the potential benefits could have substantial impact on capital investments and productivity.

To register or receive more detailed information on the seminar series, call toll-free (800) 638-7080. In Maryland: (800) 492-7170. Or write:

Martin Marietta Data Systems
Marketing Services
6303 Ivy Lane
Greenbelt, Maryland 20770

(800) 638-7080

Information Management for Strategic Planning, Productivity Analysis, and Decision Support The Practical Impact of Emerging Software Technologies Trends in PC Software

RAMIS II

- For applications development
- For the information center
- For English language comprehension

Personal Computing
IT/Software for integrated personal computing

Computer Integrated Manufacturing Systems
From the shop floor to the executive office, from the central computer to the desktop

Finance and Administration

From planning to personnel management, from the central computer to the desktop

A - April 24

B - April 25

Philadelphia, Pa., Bellcore-Grand

A - May 23

B - May 24

Chicago, Ill., Knickerbocker

A - June 5

B - June 6

Los Angeles, Ca., Hyatt White

A - June 21

B - June 22

New York, N.Y., Hilton

MARTIN MARIETTA

You are cordially invited to see
the fastest compilers for
MC68000/UNIX™

**PHILON
FAST
COMPILERS**

While you are
at Comdex
May 22-24, 1984

ESSEX A SUITE
HYATT REGENCY ATLANTA
PEACHTREE CENTER

Complimentary Refreshments 8:30am-6:30pm

Philon, Inc. • 50 Cooper Square • NY, NY 10003 • (212) 420-0317
UNIX is a trademark of Bell Laboratories.

ADD TO AND TO

To add markets as well as profits to your business, add Zaisan to your system.

The ES.1 voice/data workstation offers single-key access to simultaneous voice, data or text. With the touch of a button, users can also access internal and external databases, PBX functions and electronic mail.

The ES.1 is also upgradeable. So you can add application and communication software to tailor the ES.1 to the individual information needs of your users. Which can add sales to your business.

Another plus is the price. And the wide range of service options.

Add these all up and you'll see the formula for success is rather elementary. Add Zaisan.

13910 Champion Forest Drive, Houston, Texas 77069. 713.580.6191. The new direction in business communications.

BOARDS

from page 87

CORWAY ENGINEERING, INC. CB4502; CB4503

Conway Engineering, Inc. has introduced two latching relay cards for STD bus systems.

The CB4502 and CB4503 relay cards are software-controlled and use latching-type bifurcated relays instead of the traditional reed relays to provide STD bus users with switching capabilities.

The CB4502 reportedly is designed for twisted-pair telecommunications switching. It features bifurcated relay contacts rated at 2A. The CB4503 was designed for power equipment switching and features four relay contacts. A single user-selected STD

bus port is needed to operate either card, a vendor spokesman says. The relay cards are priced at \$200 each.

Conway Engineering, 875 Hesperia Road, Oakland, Calif. 94611.

AUXILIARY EQUIPMENT

INTERNATIONAL IMAGING SYSTEMS, INC. Odin 20

International Imaging Systems, Inc. has introduced Odin 20, a machine vision system that can be used in a variety of automated visual inspection and robotics vision applications.

According to the vendor, the Odin 20 has a proprietary architecture based on multitasking, pipelining and simultaneous operation of multiple processing cells operating in parallel.

The Odin 20 is priced at \$29,000. A lower cost version, the Odin 10, is available for \$17,000.

International Imaging Systems, 1500 Buena Vista Drive, Milpitas, Calif. 95035.

DOLCH LOGIC INSTRUMENTS, INC. TMDA 80186

Dolch Logic Instruments, Inc. has introduced a 16-bit subsystem for logic analysis of the Intel Corp. 80186 microprocessor.

The TMDA 80186 trace module reportedly permits analysis of the functional operation of an 80186-based system by tracing and recording microprocessor bus activity at the machine cycle level in real-time and displaying it in mnemonics.

The trace module is designed for use with the vendor's LAM 4860A and 64300 logic analyzers, and it connects into the pod inputs of those instruments.

The TMDA 80186 is priced at \$8,800. Users who already have the vendor's TMDA 8086 product can implement 80186 support by purchasing the 80186 buffer probe and disassembler for \$655.

Dolch Logic Instruments, 3053 Orchard Drive, San Jose, Calif. 95134.

APPLIED MICROSYSTEMS CORP. ET-2000 Microtroubleshooter

Applied Microsystems Corp. has introduced a tool for use in troubleshooting microprocessor boards. The product, the ET-2000 Microtroubleshooter, reportedly uses emulation technology and offers signal identification capability, which allows technicians to sense signal activity through the unit's probes.

The unit's signal identification capability reportedly eliminates the need for an additional voltmeter, signature analyzer and data analyzer or scope, the vendor said.

The ET-2000 can reportedly be configured to different microprocessors by using one of several personality pods.

The ET-2000 console is priced at \$3,995, the vendor said, and an 8-bit personality pod is priced at \$595. At least one personality pod will be needed to operate the unit, according to the vendor.

Applied Microsystems, 5020 146th Ave. N.E., Redmond, Wash. 98073.

From



, to



Nobody puts ideas on paper so many ways.

If you're using your printer with a personal computer, you probably need one that can handle a variety of functions.

At the same time, the price should be in line with the computer itself. Low.

The pint-sized Dataproducts printer in the picture costs about as much as one good software package.

It prints spreadsheets, graphics and illustrations, labels, multi-part forms—even letters that look like they were typed.

But let's say you're running a big computer and it's hundred-page reports you need. Pronto. Or documents by the millions.

The printer on the right finishes a full computer printout page in less time than it takes to sneeze. At 2,000 lines a minute, it prints much faster than you can see. Three shifts a day. Year after year.

In between these two special-duty Dataproducts printers are whole families of other Dataproducts printers—daisywheel

printers, non-impact printers, high-security printers for the government, and more.

In fact, we make more different kinds of computer printers than any other independent printer company in the world.

Very likely we make one that fits your needs exactly.

Write us at 6200 Canoga Avenue, Woodland Hills, CA 91365. Or phone (818) 887-3924. In Europe, 136-138 High Street, Egham, Surrey, TW 20 9HL England.

Dataproducts computer printers.



Protect your investment in The National Computer Conference ... advertise in Computerworld's NCC Daily!

Computerworld's NCC Daily! is one of the best ways for you to bring prospective clients to your booth every day of the conference. There'll be other media coverage of this event, but none more timely and informative than *NCC Daily!*

The *Computerworld* staff will publish four separate daily issues, each one editorially unique. We'll report on each day's major announcements and speeches, and we'll outline upcoming events to help attendees plan their days. So you know every issue will be well read. Which means your ad is more likely to be seen. In fact, most readers will see your message not once, but four times.

To help get your story to as many show attendees as possible, we'll distribute 25,000 copies of *NCC Daily!* each day of the show. Monday through Thursday, free copies will be available both at the show and at the major convention hotels in Las Vegas. As people read through each issue to decide which booths to visit, you'll definitely want your message there, where everyone will see it.

Space is limited, so make your reservation today. The closing date for all four issues is June 4, 1984. Just call our National Sales Director, Ed Mardecki, at (617) 879-0700. Or call any of our convenient sales offices listed below.

To: Ed Mardecki, National Sales Director
CW Communications, Inc.
Box 880
Framingham, MA 01701

- ☐ Please send me an NCC Daily! rate card.
☐ Please have a sales representative call me.

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

BOSTON/375 Cochituate Road, Box 880, Framingham, MA 01701 (617) 879-0700
CHICAGO/2600 South River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433
NEW YORK/Paramus Plaza 1, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350
ATLANTA/1853 Peeler Road, Suite D, Atlanta, GA 30338 (404) 394-0758
SAN FRANCISCO/300 Broadway, Suite 20, San Francisco, CA 94133 (415) 421-7330
LOS ANGELES/18008 Sky Park Circle, Suite 260, Irvine, CA 92714 (714) 261-1230

MICROCOMPUTERS

Is Apple taking larger bite? Accounting firm expects 2,000 Macs next month

By Eric Rosner
CW Staff

Early next month, Apple Computer, Inc. will deliver roughly 2,000 Macintosh personal computers to Fast, Marwick, Mitchell & Co. offices across the country — part of an order for 3,450 Macs which the Big Eight accounting firm placed on Feb. 29.

The shipment marks a companywide debut for a project launched in 1981, according to Fast, Marwick partner Richard Webb. The accounting firm worked hand-in-hand with Apple for well over a year, receiving its first evaluation machine in March 1983, Webb added.

Most large companies, however, were introduced to the Macintosh and the revamped Lisa personal computers at Apple's splashy January debut for the machines. Three months later, is Apple starting to take a larger bite out of the large corporation market?

"We're starting to get some tangible successes in that marketplace," claimed

Douglas Pollack, a sales development manager for the Apple 32 line. Apple has made numerous evaluation sales of 10 or 20 machines at a time, he said. Several sales at the 500- or 1,000-unit level are close to signing, according to other Apple officials, although three months is a short period for full evaluation.

"Our technology allows people to use a personal computer who otherwise just wouldn't use one — period," Pollack maintained.

Others outside Apple agreed that the new micros are beginning to filter into large corporations. "We're starting to see some activity in Fortune 1,000 types for the new Apple micros," said Ralph Wagner of Microsource Financial in Watertown, Mass. "Clearly, the Mac has caught a lot of [people's] imaginations in the corporate world."

However, Egil Juliusen, chairman of Future Computing in Richardson, Texas, See APPLE page 105

■ IBM ships the PC/AT operating system and introduces a new version of the Personal Computer XT aimed at manufacturing applications/94

■ Apple Computer, Inc. unveils a new wide-carriage dot-matrix printer/94

INSIDE

Systems/96

Printers/Potters/96

Board-Level

Devices/96

Auxiliary

Equipment/96

Software/96

Communications/94

Portable market not meeting needs

Like many other users, Robert Pontbriant, data service chief for the Internal Revenue Service's Boston district, thoroughly searched the portable computer market this spring and concluded that no one made the machine he needed.

What users like Pontbriant find are powerful machines, transportable only for professional body builders, or easy-to-carry machines with stiff ergonomics. What they need is an IBM Personal Computer the size of a Radio Shack Model 100.

While "smaller, lighter, more powerful" has been the microcomputer industry's credo, it has yet to produce a portable microcomputer that will do for the country's 13-million-plus mobile workers what Viscomp's Visicalc did for those who analyze financial data.

Large suitcase-size microcomputers sacrifice portability for functionality. While Compaq Computer Corp.'s Compaq runs software for the IBM Personal Computer, its 28-lb weight and need of an electrical outlet hamper true portability. "One has to be a linebreaker for the New England Patriots to carry some portable computer," Pontbriant remarks.

Many suitcase portables also are cumbersome to set up. "IBM used so much time setting its portable computer up for a demonstration that we couldn't seriously consider purchasing it," said John Johnson, director of the IRS' Boston district office.

Easy-to-carry lap-size computers offer limited capabilities, however. By embed-
See PORTABLE page 110

Microsoft offers project-planning tool

BELLEVUE, Wash. — Microsoft, Inc. this month introduced Project, a project-planning software tool designed to work like a spreadsheet.

"Rather than learning how to use another type of software package, spreadsheet users can easily add project-planning capabilities," said Robert Gleaser, Microsoft's product manager for business applications.

Project, which runs on an IBM Personal Computer with 128K bytes of random-access memory and Microsoft's MS-DOS operating system, features resource tables, cost tables and graphics schedules.

"We estimate that between 20% and 30% of IBM Personal Computer users want project-planning software," Gleaser said. "Yet surveys indicate that only 5% to 7%

of these users have it." Most Project users will work in medium-size to large corporations, he predicted.

The package allows department plans to be combined into larger company plans, Gleaser said. "This allows managers to integrate their subordinates' plans and gain a complete overview of the company's direction," he claimed.

Project also reportedly provides a way to transfer information to other microcomputer software, such as Microsoft's Chart and Multiplan, Ashton-Tate's DBase II, Lotus Development Corp.'s 1-2-3 and Micro International Corp.'s Wordstar.

Project costs \$250, and volume shipments are scheduled for the end of May. Microsoft is located at 10700 Northup Way, Bellevue, Wash. 98004.

3 P.M., FTD agreement leads to biggest order yet of DEC micros

By Edward Werner
CW Staff

SOUTHFIELD, Mich. — An agreement resulting in the largest order ever of DEC equipment Corp.'s Rainbow personal computers was announced this month between 3 P.M. and the Florista Transworld Delivery Association (FTD) here.

Under the agreement, the 20,000 FTD members will have the opportunity to lease DEC Rainbow 100, Rainbow 100 Plus or Micro/PDP-11 microcomputers.

The order could total \$75 million, which would make it the largest single buy ever of DEC personal computers, according to a DEC spokesman.

The FTD contract, which 3 P.M. won over roughly 35 other vendors, is also the largest ever for that firm. FTD members will use the micros to send and receive orders for flowers on the FTD Mercury network, which routes wire orders through a Sperry Corp. 1100/72 mainframe in Chicago, and to run financial ac-

counting and word processing applications using Floraserv software written by 3 P.M.

The network currently relies on some 8,400 specially designed intelligent communications terminals from Ford Aerospace and Communications Corp. The terminals have one-line 1100/72 displays and are linked to the 1100/72.

Approximately 2,000 micros are expected to be leased by FTD members in the first year of the agreement. The computers will be purchased from DEC by 3 P.M. and leased, along with DEC LA50 printers, to FTD members at rates as low as \$106 a month for a DEC Rainbow 100.

The micros provided under the agreement will be modified by 3 P.M. to contain autodial/answerover mode, custom-made by Uniserv Data Systems, Inc., which will make the connection with the Chicago computer.

The Floraserv software will in-

clude the capacity to generate direct mail to a florist's customers reminding them of such impending holidays as National Secretary's Day and urging them to buy flowers, said 3 P.M. Marketing Vice-President George Squillace.

Squillace also pointed out that 3 P.M. will offer DEC general ledger, accounts payable, payroll and inventory control software for the DEC micros.

FTD florists will not be required to lease any of the computers, but the association plans this year to do an analysis of each member's needs and to point out the advantages of moving from the terminals to personal computers, said Deborah Kalz, FTD manager of network development.

Small shops that want to transmit flower orders and add accounting features will be advised to lease the Rainbow 100, while shops that want to use the Floraserv software will need to lease the Rainbow 100 Plus, Kalz noted.

The Micro/PDP-11, according to a DEC spokesman, will not only provide all the functions of the Rainbow computers, but also can act as the host of a local network of DEC VT220 terminals, a system that could be used in a retail florist chain. The Micro/PDP-11, he said, can also interface with a store's electronic cash register, providing up-to-date accounts receivable and inventory control data.

A DEC OEM, 3 P.M. got the lease agreement over other firms that included IBM, Burroughs Corp. and Sperry (the runner-up) because of the attractiveness of its built-in lease discount, the capability of the DEC micros and FTD's desire for a single source for both hardware and software, Kalz said.

First shipments of computers under the agreement should begin shortly after May 15, Mother's Day, with training to be provided for florists by 3 P.M. at regional locations. A subsidiary of McKannan Corp., 3 P.M. is located in Livonia, Mich.



MICROCOMPUTERS

IBM releases Unix version for Personal Computer XT

IRVING, Texas — IBM began offering the Personal Computer Interactive Executive (PC/IX), its version of AT&T's Unix operating system for the Personal Computer XT, on April 23.

Separately, earlier this month, the firm unveiled the IBM 5531 Industrial Computer, a new Personal Computer

XT model for manufacturers. The \$900 PC/IX package is now available through IBM sales representatives and the firm's product centers. Previously, IBM had said PC/IX initially would be offered only through its National Accounts Division and National Marketing Division. PC/IX, announced Jan. 13

[CW, Jan. 16], was developed for IBM by Interactive Systems Corp. of Santa Monica, Calif. More information can be obtained from IBM Information Services through P.O. Box 2760, 220 Las Colinas Blvd., Irving, Texas 75062.

IBM's new 5531 system is a modified Personal Computer XT enhanced for use in in-

dustrial environments, with improved ability to handle dust, voltage surges and other potential operating difficulties, an IBM spokesman said. He described the new system as "a full-function [Personal Computer] XT for the plant floor."

A basic model comes with 128K bytes of random-access

memory, one 360K-byte floppy disk drive, a 10M-byte hard disk drive, a keyboard, a color graphics adapter and a combination adapter (with asynchronous, parallel clock and thermal sensor interfaces), IBM said. Cost of this standard system unit is \$4,740. The IBM 5532 color display will sell for \$850.

System shipments will begin in fourth-quarter 1984. More information on the 5531 is available from IBM Industrial Products through P.O. Box 1328, Boca Raton, Fla. 33432.



Dear Ma: "Thanks for the Memories."

It's hard to believe, Ma, that it's been 12 years since I left home to go to work for a fledgling modern manufacturer named Vadic. They were small then. But they sure had big ideas.

I wrote to you in 1973 about their biggest idea of all — a full-duplex 1200 bps modem. You said it was impossible, but Vadic did it! I've written often during the past decade, each time with another Vadic first. There were many.

Today, Racial-Vadic is a giant when it comes to modems. With 103s, 201s, 202s, 206s, 212s and VAS400s. They have rack mounted cards for central computer and remote multiplexer sites, and compact desk-top units for remote terminal use. And that's not all. Their product line also includes multiplexers, data compressors and auto dialers. Now, there is no reason to deal with multiple suppliers when Racial-Vadic can supply the whole system.

Thanks, Ma, for being the star of our "Letters to Ma Bell" ad campaign which ran for 12 years. We'll miss you — and that great apple pie.

Your independent thinking son,

Ally and/or Graham Jr.

FREE POSTER
Ma Bell
"Rest in Peace"

For free poster, circle 14.

Phone (800) 543-3000,
Operator 507

Racial-Vadic

1525 McCarthy Boulevard, Milpitas, CA 95035
Tel. (408) 946-2227 • TWX: 910-339-9297

RACAL

Apple offers wide-model Imagewriter

CUPERTINO, Calif. — Apple Computer, Inc. has introduced a wide-carriage model of its Imagewriter dot matrix printer. The new Wide Carriage Imagewriter, compatible with Apple II and Apple III personal computers, accommodates a range of paper widths between 3 and 15 in., Apple said.

The new printer is designed for producing documents requiring wide paper, such as spreadsheets, forecasting models, budgets and data processing reports, according to the manufacturer.

Like the standard Imagewriter, the Wide Carriage Imagewriter prints in a 7- by 9-dot matrix at rates up to 120 char./sec, Apple said. The new printer is said to feature eight character fonts and to provide variable resolution, pitch and line spacing. Various fonts, underlining and sub- and superscripts reportedly can be mixed in the same printed line. Both friction-feed and adjustable-width pin-feed traction are available.

The printer comes with connector cable, user guide, applications manual and software for printing high-resolution graphics, Apple said.

The Wide Carriage Imagewriter is available now for \$749.

Apple is located at 20525 Mariani Ave., Cupertino, Calif. 95014.



"Yes sir, I got the idea from the Colonel..."

Why the time has never been better to get your own subscription to Computerworld.

FREE CLOCK WITH YOUR SUBSCRIPTION.



Subscribe to Computerworld now, and we'll send you this miniature, personal computer clock. Free. The clock displays the date, the hour, minute and second, and makes a handsome desk-top piece for your office. And as we said, it's a gift from us to thank you for becoming a new subscriber to Computerworld.

51 ISSUES OF COMPUTERWORLD

In addition to the free timepiece, of course, you'll receive our regular 51 issues of Computerworld. So you won't have to wait for a co-worker's copy to keep up-to-date on what's taking place in the industry.

☐ **Yes** Please enter my subscription for one full year (51 issues) of Computerworld at \$44. I further understand that, with my payment or charge, I will also receive a FREE personal-computer clock. (Please allow 6-8 weeks for shipment of your free gift.)

Subscription Form

Ret Initial Middle Initial Last Name

Your Title

Company Name

Address

City State Zip Code

☐ Bill me.

☐ Payment enclosed. Send my FREE clock immediately.

☐ Charge to my credit card and send my FREE clock immediately.

☐ AmEx ☐ BA/VISA ☐ MC

MC Only List four digits above your name.)

Expiration Date

Signature

If you are using a credit card, you can enter your order by calling TOLL-FREE: 1-800-343-5736 (In Massachusetts, call collect: 617-879-0700.)

Address shown is: ☐ Home ☐ Business

☐ Check here if you do not wish to receive promotional mail.

Satisfaction Guaranteed On Paid Subscriptions:

I understand that I may cancel my subscription at any time (discontinuing the bonus issues), and request a full refund of the unused portion of my subscription and keep the clock.

Fill in and return to: 375 Cochituate Road, Box 897, Framingham, MA 01701

YOU'LL ALSO RECEIVE SPECIAL FOCUS ISSUES

As a Computerworld subscriber, you'll also receive our popular "special focus issues" — at no extra charge. These issues provide in-depth coverage on a number of important, industry-related topics.

As part of the "special focus" series, you'll receive six issues of Computerworld Office Automation, covering the exploding office automation market. Plus you'll get Computerworld On Communications, with all the latest information on changing trends in the design, acquisition, operation, and optimum use of corporate communications facilities. You'll also receive five Computerworld Buyer's Guides, filled with company and product data, referral charts, and input on product trends and new technologies.

As you can see, there are plenty of reasons to subscribe to Computerworld. So don't rely on someone else to lend you theirs. Be well-informed — with 51 issues of Computerworld plus all the special focus issues — without having to wait.

Now you know why the time has never been better to subscribe to Computerworld.

Please indicate your business, title, and computer involvement below. Circle one number in Categories 1 and 2 and all that apply in Category 3.

1. BUSINESS/INDUSTRY

See list:

10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government — State/Federal/Local
65. Public Utility/Communication Systems/Transportation
70. Mining/Construction/Recreation/Building
75. Other User

(Please specify)

Vendors

80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer Service Bureau/Software/Planning/Consulting
90. Computer/Peripheral Dealer/Distributor/Retailer
95. Other Vendor

(Please specify)

2. OCCUPATION/FUNCTION

1. President/Owner/Partner/General Manager
12. VP/Assistant VP
13. Treasurer/Controller/Financial Officer
21. Director/Manager/Supervisor Of Mgt Services
22. Director/Manager of Operations/Planning/Adm. Serv.
23. Systems Manager/Systems Analyst
31. Manager/Supervisor Programming
32. Programmer/Methods Analyst
34. QA/VP Director/Manager/Supervisor
38. Data Comm. Network Systems Mgmt.
41. Engineer/Scientific/RS&D/Technical Mgmt.
51. Manufacturing Sales Rep./Sales/Marketing Mgmt.
60. Consulting Management
70. Medical/Legal/Accounting/Management
80. Educator/Journalist/Librarian/Student
90. Other

(Please specify)

3. COMPUTER INVOLVEMENT

Type of equipment with which you are personally involved either as a user, vendor or consultant (circle all that apply).

- A. Mainframes/Supersystems
- B. Microcomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

MICROCOMPUTERS

SYSTEMS

NOTION, INC.
Worksystem 300 and 300

Notion, Inc. has announced an addition to its Ohio Scientific, Inc. (OSI) Series 300 and 300 microcomputer product line.

The Worksystem 300 is built around the OSI 200 microprocessor. It reportedly includes a 20M-byte 514-in.

hard disk and three memory partitions accommodating up to three users.

The package also comes with the vendor's T3310 terminal with tilt-and-swivel capability, a 14-in.-high green resolution screen and a detached standard keyboard with 23 programmable function keys, according to a spokesman. It also includes a daisywheel letter-quality printer that operates at 25 char./sec, the company said.

The Worksystem 300 is priced at \$4,900.

The Worksystem 300, priced at \$9,900, is based on OSI's 330 multiprocessing system. It reportedly incorporates three application processor boards and features a new hard disk controller. Both packages offer word processing and OSI's Keyboard data base management software.

Notion, 140 Sherman St., Fairfield, Conn. 06430.

DIGITAL
MICROSYSTEMS, INC.
DMS-816

Digital Microsystems, Inc. has announced DMS-816, an IBM Personal Computer-compatible microcomputer that can be used as a workstation in Digital Microsystems' Rinet local-area network.

The microcomputer features 2Mg, Inc.'s 2805 microprocessor, a mapped monochrome display, 94-key keyboard, a serial port, RS-422

port for Rinet and a Centronics Data Computer Corp. type parallel port, according to the vendor. Since DMS-816 uses two microprocessors, it reportedly can run under Microsoft, Inc.'s MS-DOS or Digital Research, Inc.'s CP/M operating systems.

Rinet features record-keeping, electronic mail, shared use of peripherals and support for up to 31 DMS-816s, the vendor said.

DMS-816 costs \$1,000. Digital Microsystems, 1840 Babcock Road, Oakland, Calif. 94604.

DECISION DATA
COMPUTER CORP.
DDCC 5021-01

Decision Data Computer Corp. has announced DDCC 5021-01, a microcomputer said to be compatible with the IBM Personal Computer and to emulate IBM 5250 series terminals, which are used primarily on IBM System/36, 34 and 38 minicomputers.

DDCC 5021-01 features an Intel Corp. 8086 microprocessor, 128K bytes of random-access memory expandable to 640K bytes, two 360K-byte floppy disk drives, four expansion slots, an 83-key keyboard, a monochrome monitor, Microsoft, Inc.'s MS-DOS operating system and 5250 series terminal emulation software, Decision Data said. By pressing one key, a user can switch between microcomputer applications and terminal emulation, the vendor said.

The microcomputer costs \$4,077.

Decision Data Computer, 100 Witmer Road, Norwalk, Pa. 19044.

GADO SYSTEMS CORP.
Tiger ATS 16

Gado Systems Corp. has announced a modular, multi-tasking, small business system designed to support up to 16 terminals and peripherals.

The Tiger ATS 16 is a 3-cube-ft system built around an Intel Corp. 80186 microprocessor, Gado said. The basic system reportedly consists of the microprocessor, 512K bytes of random-access memory, 10M bytes of Winchester disk storage, 1.3M bytes of diskette storage and a serial I/O card with RS-422C connectors for four devices.

The system can be expanded with three additional serial I/O cards, 72M bytes of disk storage, 65M bytes of streaming tape cartridge and a total of 16 devices, according to the company.

Deliveries are scheduled to begin in May.

List price for the basic system is \$12,500.

Gado Systems, 2055 W. 190th St., Torrance, Calif. 90510.



"Oh no! Somebody got into the computer room last night."

"I don't know who was maddest - our data processing manager, our controller or our auditors. But they all came into my office and complained that anyone could get into the computer room - at any time. So, we installed an RES CARDENTRY® system, and now we control who uses the computer room. And our smart machines are protected by some other pretty smart machines."

As well they should be.

Without an RES CARDENTRY system to protect your data processing facility, it can be subject to information security breaches, as well as damage to your expensive computer.

An RES CARDENTRY system solves the problem of securing your data processing equipment. It also does away with employee keys (and the possibility of duplicating them), and lack of personnel accountability.

When we install a CARDENTRY system, we give each employee a RUSCARD™ with a personalized code. The cards are virtually impossible to duplicate. Your computer center

utilizes compact CARDENTRY readers. You tell your system who's allowed in and when. Then, if an unauthorized person tries to enter the facility the door won't open.

What's more, the RES CARDENTRY system tells your security guard where and when an unauthorized entry has been attempted - in easy-to-read English text.

It's that easy to account for (and control) unauthorized access and activities. And it's that easy to save money.

Your RES CARDENTRY system can even turn utilities on and off at pre-determined times, streamline your data collection activities and provide real-time monitoring, pre-defined, and user-defined historical reports. Small wonder we're the world leader in access control & monitoring systems.

So if your computer isn't already protected by our system, it should be. After all, do you know who's using it right now?

For more information, contact: Rusco Electronic Systems, 1840 Victory Blvd., Glendale, CA 91201. Telephone: (818) 240-2540. Or, call toll free: (40 states, exempt CA) 1-800-566-1234. Ext. 67; (CA only) 1-800-441-2345, Ext. 67. Telex 906318.



RES RUSCO
ELECTRONIC
SYSTEMS
A RUSCO INTERNATIONAL COMPANY

CARDENTRY is a registered trademark and RUSCARD is a trademark of Rusco Electronic Systems.

YOU DON'T HAVE TO PICK OUR EQUIPMENT TO PICK OUR BRAINS.

Whether you're an AT&T customer or not, the Communications Management Institute will provide you with the knowledge you need to plan, implement and control your information management systems in a more effective way.

For more than 100 years, AT&T has pioneered the field of information management, with an endless stream of innovations. Today, no one else is better prepared to review the state of Communications and Information Management Systems—from our products to our competitors' products.



Communications
Management
Institute

Courses will be held at Callaway Gardens in Pine Mountain, Georgia. At this renowned conference center, you'll experience an environment conducive to learning, with outstanding accommodations.

See the schedule below for detailed course objectives, and dates for April, May, June and July.

Call 1 800 247-1212 ext. 302 for more information or to enroll. Or fill out the coupon below and return it to Communications Management Institute, P.O. Box 8, Pine Mountain, Georgia 31822-0008.

INFORMATION RESOURCES PLANNING "AN APPROACH TO OFFICE INFORMATION SERVICES"

3½ Days—\$800
May 14-17, Jun. 11-14

This course is for the managers and influencers who are responsible for improving the productivity and the effectiveness of people in their office environment. It provides a simulated experience in managing office information resources. This interdisciplinary approach will broaden the perspective of the planning, needs assessment and design process necessary for total information systems integration.

COURSE OBJECTIVES

- Establish a planning process for information systems integration by applying fundamental organizational planning concepts.
- Extend the information systems planning process to include specific methodologies for identifying opportunities within the office that offer high potential for return on investment.
- Design and strategically manage an information systems plan with emphasis on positive performance.
- Make convincingly communicate the benefits of information systems concepts and technologies through the use of presentation aids and techniques.

LOCAL AREA NETWORKING "BUILDING FOR THE FUTURE"

3½ Days—\$800
Apr. 9-12, May 14-17
Jul. 23-26

This course is designed to communicate an understanding of present LAN technologies and applications within the corporate structure, and provide the skills to effectively plan, design, and implement a LAN. The course will further examine individual vendor offerings and the management and control systems which ensure optimum performance of a LAN. This course is aimed at the manager who has limited knowledge in the field of local area networking.

COURSE OBJECTIVES

- Define primary and secondary applications within the corporate structure.
- Plan, design, and implement a LAN to meet corporate objectives.
- Establish a network management and control system for optimum LAN performance.
- Evaluate vendor products in the LAN market segment.

INFORMATION DISTRIBUTION MANAGEMENT "NETWORKING FOR THE 90s"

4 Days—\$920
Apr. 9-12, May 21-24
Jul. 16-19

This course provides an introduction to and a top-down overview of current voice and data network technologies. The session provides a forum for discussion and development of strategies and tactics to meet the needs of a new corporate communications environment. The course is designed for the manager who has limited experience in voice and data, and wants a better understanding of integration alternatives that use LANs, VANs and PBXs.

COURSE OBJECTIVES

- Identify voice and data network applications, features, and operating characteristics.
- Determine potential applications for local area and value-added networks for their companies.
- Evaluate integrated data, voice, facsimile, and video systems—including PBX and networking alternatives.
- Manage the use of current approaches and procedures involved in planning, implementing, and controlling a network.



AT&T
Information Systems

Call 1 800 247-1212, ext 302

COMMUNICATIONS MANAGEMENT INSTITUTE P.O. BOX 8, PINE MOUNTAIN, GEORGIA 31822-0008

NAME _____ LAST _____ FIRST _____
TITLE _____
COMPANY _____
() TELEPHONE NO. _____
MAILING ADDRESS _____
CITY _____ STATE _____ ZIP _____

PLEASE REGISTER ME FOR:

COURSE _____

SESSION _____

☐ I am interested in the courses offered, but unable to enroll at this time.

Please keep me informed of future course dates.

☐ Payment/purchase order enclosed. Make checks payable to: AT&T Information Systems.

You are cordially invited to see
the fastest compilers for
MC68000/UNIX™

PHILON
FAST
COMPILERS

While you are
at Comdex
May 22-24, 1984

ESSEX A SUITE
HYATT REGENCY ATLANTA
PEACHTREE CENTER

Complimentary Refreshments 8:30am-6:30pm

Philon, Inc. • 50 Cooper Square • NY, NY 10003 • (212) 420-0317
UNIX is a trademark of Bell Laboratories.

IS YOUR VAX TERMINALLY BOGGED DOWN?



XYPLEX

MICROCOMPUTERS

PRINTERS/PLOTTERS/ PERIPHERALS

EXTENDED SYSTEMS, INC. ESI-3002, ESI-3004 Sharpools

Extended Systems, Inc. has introduced two peripherals that reportedly enable up to three Hewlett-Packard Co. HP 150 microcomputers to share one printer.

The ESI-3002 and ESI-3004 Sharpools are said to set line intelligent printer interfaces, automatically spooling and managing print output for one to three personal computers. The Sharpools require only one option slot in one HP 150.

The ESI-3002 offers the capability to share an RS-232C interfaced prin-

ter with up to three HP 150s. It is equipped with 64K bytes of speaker memory, which is expandable to 128K bytes, according to the company.

The ESI-3004 reportedly allows up to three HP 150s to share a Centronics Data Computer Corp.-compatible interfaced printer.

It accepts RS-232C output and converts the output to parallel format and offloads spooling and print management functions from the personal computer, the vendor said.

Basic ESI-3002 and ESI-3004 models with 64K bytes of memory are priced at \$485 each and are available now.

Extended Systems, P.O. Box 4687, Boise, Idaho 83711.

CAL-ALCO PERIPHERALS Legend 800

Cal-Alco Peripherals has introduced a dot matrix printer that is reportedly capable of bidirectional printing at 80 char./sec.

The Legend 800 features a replaceable printhead said to be able to print 30 million characters during its lifetime. Other features reportedly include the capability to function in alphanumeric, semigraphic and bit-image graphics modes; 256 Ascii characters in normal and italic alphanumeric fonts; and the ability to produce symbols and semigraphic elements.

Among the unit's features are superscript and subscript, double width (60 col.), compressed print (143 col.), double/compressed print (71 col.) and bold print output. The Legend 800 also can produce a square print dot, which offers a highly legible typeface.

The Legend 800 has a Centronics Data Computer Corp. parallel interface, with a serial interface offered as an option, according to the vendor. The printer is priced at less than \$350.

Cal-Alco Peripherals, 14722 Concord St., Van Nuys, Calif. 91411.

TOSHIBA AMERICA, INC. P1351, P1340

Toshiba America, Inc. has introduced two dot matrix printers: the P1351 and the P1340.

The P1351 uses a 24-pin printhead, which has a projected life of 200 million impressions and is pin-replaceable, according to the vendor.

The 135-col. P1351 produces letter-quality work at a speed of 100 char./sec, drafts copies at a speed of 192 char./sec and produces graphics output with a resolution of 180 by 180 dot/in., according to a vendor spokesman.

P1351 uses either a Centronics Data Computer Corp.-compatible parallel port or an RS-232C serial port, the vendor said.

The P1340, an 80-col. printer, prints letter-quality copy at 84 char./sec, drafts quality documents at 144 char./sec and produces graphics output with a resolution of 180 by 180 dot/in., according to Toshiba.

The printer reportedly offers underlines, bold-type superscripts and subscripts.

It uses a Centronics parallel port, the vendor said.

P1351 costs \$2,295, and the P1340 sells for \$905.

Toshiba America, Information Systems Division, 2441 Michelle Drive, Tustin, Calif. 92680.

MINICOMPUTERS

BOARD-LEVEL DEVICES

INTELLIGENT COMPUTER

INTEGRATION, INC.
Model DMM1; Model DMT1

Intelligent Computer Integration, Inc. has announced Model DMM1, a memory board, and Model DMT1, a magnetic tape coupler, for Data General Corp.'s Desktop Model 20 and Model 30 microcomputers.

Model DMM1's random-access memory (RAM) ranges in size from 5M bytes to 2M bytes in 512K-byte increments, according to the vendor. The board is compatible with the Desktop microcomputers, the vendor said. The 1.5M and 2M-byte boards reportedly free three expansion slots.

Model DMT1 links the microcomputer to any industry-standard formatted magnetic tape, the vendor said. The vendor reportedly can supply a complete tape subsystem with a range of sizes and speeds.

Model DMM1 prices range from \$2,000 to \$10,000; Model DMT1 sells for \$1,900.

Intelligent Computer Integration, Suite 2, 570 W. Lambert Road, Brea, Calif. 92621.

AUXILIARY EQUIPMENT

VIRTUAL MICROSYSTEMS, INC.
PC-Bridge

Virtual Microsystems, Inc. (VMI) has unveiled the PC-Bridge system, designed to create an IBM Personal Computer environment on the Digital Equipment Corp. Professional 350 and the Micro PDP-11 microcomputers. According to VMI, users of PC-Bridge will be able to run most IBM Personal Computer programs on either of the DEC systems.

PC-Bridge includes a software package and a coprocessor board, called an 86-Board, that features an 8086 processor and 256K bytes of random-access memory.

The software is said to use the coprocessor board to build a complete virtual PC-DOS environment, including virtual floppy diskettes, a virtual printer and a virtual terminal.

In addition, the 86-Board for the Professional 350 reportedly emulates an IBM Personal Computer color graphics card so that programs which write directly to the Personal Computer bit-map can also be supported. An 8087 floating-point unit is optional.

PC-Bridge for either the Professional 350 or Micro-11 is priced at \$1,760.

Virtual Microsystems, Suite 720, 2150 Shattuck Ave., Berkeley, Calif. 94704.

MICROSIZE, INC.
Micro-Com 1000

Microsize, Inc. has introduced a computer output microfilm recorder reportedly capable of producing microfiche directly from computer data that has been sent from a microcomputer or minicomputer.

The Micro-Com 1000 connects to the computer through an RS-232C serial interface or a Centronics Data Computer Corp.-compatible parallel interface. It is said to accept the same page formatting and printing commands as standard printers.

The Micro-Com 1000 reportedly is capable of less reduction of 48 times or 48 times the original film. Page configurations are either 128 by 66 characters or 80 by 66

characters.

Single reloadable film cassettes are used for film handling, which allows for daylight operation and processing, according to Microsize. Optional titling is achieved with the addition of the vendor's 5600 titling system, and an optional CRT also is available. Micro-Com 1000 costs \$19,960.

Microsize, Suite F, 3007 S.W. Temple, Salt Lake City, Utah 84115.

MICRO PRODUCTS CO.
Micro/File 40

Micro Products Co. has introduced a floppy disk storage case that stores up to 40 diskettes in individual track slots.

Micro/File 40 reportedly stores both 34 in. and 34 in. diskettes and is made of material said to resist scratching and breaking.

Micro/File 40 is priced at
Continued on page 102

A
MINICOMPUTER
NETWORK
CAN INCREASE
YOUR
PRODUCTIVITY.
OR YOUR
PHONE BILLS.

Most companies experience the same thing when they start trying remote terminals to their minicomputer. Much higher phone bills.

But now there's an inexpensive solution to that costly problem: The new Codex 6002 Intelligent Network Processor.

This low-cost multiplexer will save you money even if you're using as few as two terminals. The 6002 boosts operating efficiency, reduces the number of needed lines and protects data from errors due to line disturbances. And it can handle any mix of up to 16 asynchronous terminals, including graphics terminals, word processors and personal computers from virtually any manufacturer.

Plus, only with the 6002 can you add asynchronous equipment without worrying if your multiplexer is compatible or not. So not only will it save you money now, but also later as your network grows and grows.

The Codex 6002 Intelligent Network Processor. It's just one of our many products that enable minicomputer users to develop and efficiently manage a growing network.

To learn more about the 6002, call 1-800-821-7700, ext. 892. Or write: Codex Corporation, Dept. 707-92, 20 Cabot Boulevard, Mansfield, MA 02048.

codex
INTELLIGENT NETWORK PROCESSORS



Four-Phase is helping more than 2,000 DP managers win the productivity game. Now it's your turn.

It's easy to win the distributed information processing game when you play it with the Series 4000 from Four-Phase. The Series 4000 is an integrated, growth-oriented system designed to communicate within your IBM environment. No other vendor gives you so many functions for so many years at such affordable prices. In the distributed processing arena, that's the way to score points with both end-users and top management.

You win the DDP game with software.

Four-Phase provides one of the most impressive and complete collections of software ever offered from one company. Our packages make integrating Four-Phase computers remarkably easy. And guarantee a logical growth path for years to come. Here's just a sample of what we provide:

Interactive processing: VISION® — For creating custom applications from order entry to transaction processing. It provides a high level of functionality that can be used in any distributed environment. And VISION is easier and faster to program than COBOL.

Word processing: FOREWORD® — Our powerful shared-logic word processing system allows text to be entered, stored, edited, distributed and printed.

Graphics — For business graphics, the Graphics Management System (GMS/IV) gives you an easy way to condense and conceptually present data that's easily understood by decision makers.

COBOL — Industry standard COBOL is used to write programs for handling keyboard-entered data and general batch processing.

When they want PC's you've got them!

If your end-users are like most these days, they're clamoring for their own personal computers. We play that



The action starts with the Multifunction Executive.

The key to the Series 4000 game plan is the Four-Phase Multifunction Executive (MFE). This unique and powerful control program monitors each multifunction terminal in your system. Its ability to run multiple software programs allows your users to perform 16 different tasks from any terminal on the system. And each of your users can access all of our software packages with one keystroke. You get maximum distributed processing capability and control.

Plus, MFE dynamically allocates selected peripherals so that each device can be used by more than one program. The result — MFE eliminates the need for multiple processors, duplicate terminals and other peripheral devices at installations that require concurrent execution of software.

game, too. Because at the flick of a switch, our multifunction terminals suddenly become stand-alone PC's. So now you can give your users the distributed processing capabilities they need, AND the personal computers they want. All in one integrated system.

2,000 managers win the productivity game.

Four-Phase was the first company to introduce the integrated approach to multifunction distributed processing. Today, there are more than 15,000 installed Series 4000 systems, helping people like you manage the information needs of over 150,000 end-users. And every machine is backed by our Customer Support Operation and over 1,000 field service people to provide continuing support and reliability at every level.

Four-Phase customers have been winning the DDP game for years. You can, too. To find out how, call us today at 1-800-528-6050, ext. 1599. In Arizona, call 1-800-352-0458, ext. 1599. For a free poster of this illustration, write to us at 10700 North De Anza Blvd., M/S 52-6A9, Dept. P, Cupertino, CA 95014.

VISION, FOREWORD and Multifunction Executive are registered trademarks of Four-Phase Systems, Inc. MOTOROLA and ® are registered trademarks of Motorola, Inc. Four-Phase and the Four-Phase logo are registered trademarks of Four-Phase Systems, Inc. GMS/IV is a trademark of Four-Phase Systems, Inc.



MOTOROLA
Four-Phase Systems

MICROCOMPUTERS

Continued from page 98

\$27.95. Deliveries will begin May 1. Micro Products, 2210 N. 45th, Seattle, Wash. 98103.

VECTRIX CORP. Midas

Vectrix Corp. has introduced a color-card set said to provide color graphics capability for the IBM Personal Computer and Personal Computer XT.

The Midas color card is compatible with all software written for the IBM color card in the Personal Computer or XT, a vendor spokesman said. It reportedly features a graphics resolution of 675 by 480 pixels with 512 colors per pixel. The set offers 4,096 standard colors, with an optional pal-

ette of 16.8 million colors.

Other standard features reportedly include 384K-byte graphics random-access memory, hardware zoom with room, light-pen support and a Microsoft, Inc. MS-DOS 2.0 software driver.

The Midas color card is priced at \$2,395.

Vectrix, 3605 Branchwood Drive, Greensboro, N.C. 27403.

JOHN D. OWENS ASSOCIATES, INC.

Lehigh Valley Logic Data Encryptor

John D. Owens Associates, Inc. has introduced two models of the Lehigh Valley Logic Data Encryptor, which is used with S100 bus systems.

The encryptor uses the National

Bureau of Standards' Data Encryption Standard (DES) to protect data and reportedly is 10 times faster than other systems using DES. Enciphering data is based on DES and a key binary number.

Model 11X-100A, which operates at 3 MHz, costs \$695; Model 11X-100B, operating at 4 MHz, costs \$645. John D. Owens Associates, 18 Schubert St., Staten Island, N.Y. 10305.

SOFTWARE

DBI SOFTWARE PRODUCTS

Kalidoscope

DBI Software Products has intro-

duced a data management software package for use with Digital Research, Inc.'s CP/M 80 and Microsoft, Inc.'s MS-DOS operating systems.

Kalidoscope is composed of four modules that handle three office functions: file management, financial modeling and word processing, the vendor said. The programs reportedly enable the user to receive, manipulate and control data using 30 commands.

One feature of the software is the ability to "leapfrog" through nine files simultaneously, DBI said. An escape clause is said to permit users to insert Basic code into the vendor's language routine.

The modules run on the IBM Personal Computer; Victor Business Products, Inc. Victor 9000; Digital Equipment Corp. Rainbow 100 and Professional; Wang Laboratories, Inc. Professional Computer; Kaypro Corp. Kaypro Models 2 and 4; the Smith Data Systems Corp. Z90; and other machines.

The package, available immediately, is priced at \$695.

DBI Software Products, 6305 E. Pickard Road, Mount Pleasant, Mich. 48855.

TEKAS INSTRUMENTS, INC. Tiform/PC

Texas Instruments, Inc. has announced Tiform/PC, which is said to be a form-based management utility that reduces development time for TI's Professional Computer software by simplifying screen design.

Tiform/PC reportedly is highly compatible with Tiform 900 for TI's Business System Series. Because of this compatibility, screen formats in application programs can be migrated easily from Business System minicomputers to the TI Professional or Portable Professional Computers, the vendor said.

Tiform/PC is said to provide essentially the same screen-development capabilities as Tiform 900. With Tiform/PC, application programs reportedly do not need special routines to handle data entry or validation. The application program issues calls to the Tiform/PC runtime to display an appropriate form, obtains data from the user and prepares it for use by the program.

Tiform/PC allows a choice of eight colors or monochrome intensities for each field or mask on the screen. It includes interfaces for Ryan McPhand Corp.'s RM/Cobol 1.5; Microsoft, Inc.'s MS-Pascal 3.01 and MS-Fortran 3.04. The program requires Microsoft's MS-DOS, 192K bytes of random-access memory and two disk drives.

It is priced at \$400. TI, Data Systems Group, P.O. Box 502146, Dallas, Texas 75220.

APPLIED SOFTWARE TECHNOLOGY, INC. Versaform update

Applied Software Technology, Inc. has introduced Release 2.7 of the Versaform business form data base, running on the Wang Professional Computer under Microsoft, Inc.'s MS-DOS.

Versaform reportedly allows the nontechnical business and professional user to create personalized business applications and data bases using a form-oriented record. Pre-printed forms such as invoices, pur-

Continued on page 104

The PC security problem



eliminated

HOW THE TERMINALS THAT GIVE YOU SO FEW PROBLEMS CAN WIND UP GIVING YOU NONE AT ALL.



© 1984, Teletype Corporation.
"Teletype" is a registered
trademark and service mark
of Teletype Corporation.

While we at Teletype Corporation like to talk about our terminals' remarkable record for reliability, we have to admit that every once in a while you just might have a problem with one.

But if you contract with Teletype's Product Service Organization, getting good service is no problem at all. That's because no one can service our full line of CRT's and teleprinters as well as our service technicians. Each one of them is a company-trained, job tested professional who must continually meet our expectations—and yours.

Help is never more than a phone call away since our technicians are on-call 24 hours a day, 7 days a week. And with our network of 100 offices nationwide, we're able to provide fast response time, even to remote areas. You can contract with us for response times as low as 2 hours, or less, as your needs dictate.

But at Teletype, we feel there's something more important than fast response time. And that's fast restoration.

So when our technicians call on you, they'll have the necessary test equipment and original Teletype® parts to get your terminals up and running in no time flat.

We'll even help solve problems before they occur with scheduled preventative maintenance. You can also choose our installation service option that includes everything from getting your terminals on-line to user orientation. It's all a part of our Full Service Maintenance Agreement.

So to keep your problems from becoming big problems, write Teletype Corporation Product Service Organization, 2330 Eastern Ave., Dept. 2800-A Elk Grove Village, IL 60007. Or call toll free at 800-323-4226, ext. 300. (In Illinois, 1 800 942-4192, ext. 300.)

TELETYPE: VALUE SETS US APART.



AT&T

Teletype Corporation

MICROCOMPUTERS

Continued from page 162
 chase orders or medical insurance claim forms may be filled from screen data by simple instructions, the vendor said.

Mainframe system requirements are said to be 62K bytes of system storage and two double-sided, double-density disk drives.

Applied Software Technology, 170 Knowles Drive, Los Gatos, Calif. 95030.

MARTIN MARIETTA DATA SYSTEMS

Keypit, Calcit, Linkit updates

Martin Marietta Data Systems' IT software division has announced enhanced releases for three of its programs in the IT series of software for IBM and IBM-compatible microcomputers.

Updates have been provided for Keypit, the data base manager of the IT series; Calcit, a three-dimensional spreadsheet; and Linkit, an asynchronous communications package that provides Personal Computer-to-mainframe and Personal Computer-to-Personal Computer links.

Keypit 2.2 allows all cataloged reports and interfaces to be edited, and full screen editing is supported throughout the system, the vendor said. A split-screen capability is said to permit users to display data at the top of the screen while entering data on multiple screens. An option called View Data reportedly enables users to page through a file, viewing records that meet certain criteria.

Calcit 2.0 is said to offer full-word command prompts, color monitor support, traveling coordinate markers, expanded on-line help and easier cell referencing. Calcit 2.0 sorts columns, rows or pages on three fields and permits user-defined sort definition, the company said.

Enhancements of Linkit 2.0 reportedly include Digital Equipment Corp. VT100 emulation and the ability to run foreground programs with file transfers operating in the background.

IT series packages range in price from \$100 to \$600 and are available for the IBM Personal Computer XT and compatible systems. Versions of Keypit are also available for Wang Laboratories, Inc. and

DEC microcomputers.

Martin Marietta Data Systems/Software, P.O. Box 2392, Princeton, N.J. 08540.

FORTE DATA SYSTEMS, INC.

Forte-Print

Forte Data Systems, Inc. has introduced Forte-Print, a software package that allows mainframe computer data to be printed on a printer connected to an IBM Personal

Computer.

Forte-Print reportedly features menu-driven selections, background printing and simultaneous printing with other functions.

Forte-Print offers extended highlighting support and emulation of either print or display functions, the vendor said.

Forte-Print costs \$1,195. Forte Data Systems, 1500 Norman Ave., Santa Clara, Calif. 95050.

COMMUNICATIONS

VEN-TEL, INC. PC Modem Half Card

Ven-Tel, Inc. has announced the PC Modem Half Card, an internal modem that fits inside the half-size expansion slots of the IBM Portable Personal Computer.

The PC Modem Half Card is said to feature 1,200 and 300 bit/sec operation, as well

as autoanswer and autodial capabilities.

The system includes Crosstalk-XVI — a communications software package that handles automatic dialing — logon, terminal emulation and automatic data capture. In addition, script processing allows the user to define and store a series of tasks for the modem in a single keystroke.

The PC Modem Half Card is said to be compatible with virtually all other commu-



- 8000 system and 80000 CDS files
 - easy to use
 - many other CONCEPT functions
 - extensive PRIME statements
 - free 30-day trial period
 - \$1200 one-time or \$60 month
- sdh**
 A Division of S.D. Systems
 8001 University Avenue P.O. Box 208
 Menlo Park, CA 94025
 (415) 321-0000

MICROCOMPUTERS

cations software.

The PC Modem Half Card system includes the microprocessor-based modem, Crosstalk-XVI software, instructions and phone cable. The system is priced at \$640. Ver-Tel, 2248 Walnut Ave., Santa Clara, Calif. 95051.

THE INFORMATION PEOPLE InfoShare II

The Information People

has introduced InfoShare II, a microcomputer communications interface. The software package offers automatic features designed to ease communications between a variety of microcomputers.

The product can be used with the Digital Equipment Corp. Rainbow, the Xerox Corp. 630, the Smith Corp. 2100 or the IBM Personal Computer, the vendor said.

A "universal installer" reportedly can put InfoShare

on any 8- or 16-bit microcomputer capable of running Digital Research, Inc.'s CP/M, Microsoft, Inc.'s MS-DOS or IBM's PC-DOS operating systems.

InfoShare may be operated from menus or automatically using command files to control telephone dialing, logon and information exchange.

The program can transfer either text or program data on most systems at speeds up to 9,600 bit/sec. with full error

detection and correction.

Licenses fees begin at \$149 for paired, single-user InfoShare II systems.

The Information People, 447 Hudson Ave., Newark, Ohio 43055.

MACKENEN DISTRIBUTED SYSTEMS File Transfer System

Mackenen Distributed Systems has introduced File Transfer System, a utility

program that allows file transfer between IBM mainframes and IBM Personal Computers.

The program offers bidirectional file transfer between IBM mainframes using the TSO operating environment and Personal Computers using the Digital Communications Association, Inc. Irma decision support interface, the vendor said.

File Transfer System features error detection and correction capabilities, continuous file transfer status updates and batch or interactive modes, according to the vendor.

File Transfer System sells for \$296.

Mackenen Distributed Systems, 3323 Pearl St., Santa Monica, Calif. 90405.

URGEO SOFTWARE, INC. Apple Bayne

Urgio Software, Inc. has introduced Apple Bayne, a communications package which allows Apple Computer, Inc.'s Apple II microcomputers to communicate with IBM mainframes.

The product enables the Apple II to function as a remote job entry workstation and provide data transmission in a batch teleprocessing environment, Urgio said.

Apple Bayne features a self-contained editor, executive file processor, complete error checking, blocking and compression and direct interface to IBM mainframe packages, according to the vendor.

Apple Bayne costs \$960. Urgio Software, P.O. Box 253, Rt. 4, Cheney, Wash. 99004.

Herbie Briggs has just destroyed the myth that all floppy discs are created equal.

They seem equal. Until you look at the seams.

That's where equality ends.

Most companies seal their discs with a spot here, a spot there. Leaving most of each seam not sealed at all.

Sooner or later, the seams might do what comes naturally: they bulge. Warp. Pucker. Open up.

Pens, pencils, fingernails—even a four-year-old's, like Herbie—can catch and snag in those wide open spaces.

That's sloppy. And dangerous. Because if you put a sloppy floppy into your disc drive, it can jam your drive. Ruin your drive head. Lose your data.

So much for their seams. Ours are different.

Floppy stiffer. Stronger. And your data safer.

To resist bulging, warping, puckering, or opening up.



To resist all the things that can jam your drive, ruin your drive head, or lose your data.

Which proves that a Memorex floppy disc isn't equal to all the others. It's better.

Solid-Seam Bonding is just one example of the extra care that goes into every Memorex floppy disc. Be it 8" 5¼" or the new 5¼". Extra care that lets us guarantee every Memorex disc to be 100% error-free.

The next time you're buying a floppy disc—or a few hundred of them—just remember this:

It's always better to be safe than sloppy.

For more information on the full line of Memorex quality computer media products, including computer tape, call toll-free: 800-222-1150. In Alaska and Hawaii call collect: 408-987-2961.



THE SLOPPY FLOPPY:

Sealed with a spot here, a spot there. Leaving unsealed seams everywhere.



Memorex uses a process we developed, called Solid-Seam Bonding.

Solid-Seam Bonding seals shut every inch of every seam of every Memorex floppy disc. Tight as a drum. That makes the Memorex

Your Data. When it matters, make it Memorex.™

MEMOREX



MICROCOMPUTERS

COMMUNICATIONS

INDUSTRIAL RESOURCE ENGINEERING, INC.
Scrambler

Industrial Resource Engineering, Inc. has introduced Scrambler, an encryption device for microcomputers.

The product prevents people from accessing data files sent over telephone lines, according to the vendor spokesman.

A set of 300 to 1,300 bit/sec Scramblers costs \$550; a set of 300 to 8,600 bit/sec encryptions sells for \$900. Cables for connecting Scramblers ranges in price from \$36.95 to \$65.48, according to the vendor.

Industrial Resource Engineering, Box 67, Timonium, Md. 21088.

APPLE Run page 91

noted that "the large corporations have pretty much settled on the IBM standard. I don't see them moving toward Apple much."

Apple is marketing the Apple 32s as a family, which starts with the Mac and rises to the Lisa 2/10 (complete with 10M-byte hard disk drive), but most outsiders say that the Macintosh is the driving force.

"Nobody can walk past the Mac without sitting down and playing with it," one analyst remarked. And the Mac truly is easy to use, Webb said. During training sessions at Pest, Warwick, coordinators receive 45 minutes of instruction, and then each unpacks a Macintosh from its shipping box. "Everyone takes them out, fires them up and gets to work,"

Webb said. "All are up and running in 45 to 60 minutes."

The Mac's powerful Motorola Corp. 68000 processor, compactness and aggressive pricing also will prove to be strong advantages in the business market, industry experts said. But the Mac's current installation places some severe constraints on business users.

Among these is the limited number of application packages available for the machine. Apple's MacPaint graphics package, MacWrite word processing program and Microsoft, Inc.'s Multiplan spreadsheet package are the only current offerings.

Apple officials acknowledge the lack of choice, but point out that over a hundred developers are now creating packages. "In two or three months, software will be a nonissue,"

Pollack claimed.

Analysts agreed that the lack of software is being addressed, but think the time frame may be somewhat longer. "In May, June and July, I think we won't be able to keep up with the announcements," said Aaron Goldberg of International Data Corp., Framingham, Mass.

Juliusson predicted that relatively little software will be offered until early fall, but added that market drivers are encouraging small software developers to develop Mac versions. "You can enter the market at relatively low cost and make your name quickly," he pointed out.

Another major drawback is that the Mac's Insignia printer cannot produce a standard letter-quality business letter. "It's the easiest-to-use word processor ever built, and you can't produce a business letter," complained Stephen Carwell of Trigon Systems Group in Toronto.

Other analysts also called this a fundamental problem for a business computer, but Goldberg pointed out that "not all that many PCs [personal computers] use letter-quality printers," and that many jobs don't require letter-quality printouts. MacWrite's Webb said the firm will use its Macs for internal documents, not for materials presented to clients.

In addition, some observers expect Apple to announce a laser printer this summer.

Among other potential disadvantages, many users would like a second microfloppy disk drive. "The lack of a second drive is quite significant," Carwell said. "You keep switching disks, which is a real pain." Apple plans to ship an external microfloppy drive shortly, Pollack said. Meanwhile, other vendors are announcing hard disk drives.

The Mac's 128K bytes of random-access memory is insufficient to run many large integrated packages, such as Lotus Development Corp.'s 1-2-3. Apple plans to offer 512K-byte models whenever sufficient supplies of 256K-bit chips become available. No date has been announced, but fall shipments are expected. "Additional memory is very important, and the sooner it's available the better," commented Juliusson.

Additionally, no delivery schedule has been given for the network software needed to drive Applebus, Apple's low-speed, local-area network, although some an announcement may come soon. Third-party local-area networks are expected later this year. However, teletype, Digital Equipment Corp. and IBM terminal-emulation options are offered, Pollack said.

In sum, the Mac limitations are not "overriding concerns," Pollack maintained, but those corporations worried about them have a simple solution: buy a Lisa. The choice comes down to the level of computing power required, he said.

"The Lisa is being pulled by the Mac," Juliusson said. "The Mac gets you interested. If you're doing business, you quickly find out that the Lisa's what you should buy."

"All the publicity is for the Mac, but the Lisa 2/10 is a hell of a machine for the money," Goldberg commented.

Wagner noted that customers now can buy into the Lisa line for around \$3,500. The new Lisas will offer many more software choices and work much faster than the original model, Wagner added. "With the

See LISA page 110

FACE THE REAL COST OF DIVESTITURE

Managing Complex, Multicenter/Vendor Networks Diagnosing Faults
Crossing Carrier Gateways Interfacing Voice, Data and Telecom Equipment
Optimizing Hardware, Tariff and Software Opportunities

NETWORK
MANAGEMENT
TECHNICAL
CONTROL

Learn how at the new

Conference & Exposition

May 21-24 1984, Sheraton Washington Hotel, Washington, D.C.

Sponsored by the Communication Networks '84 Team

First program to ZERO IN on Divestiture: Operating Headaches — See new tech. control and software solutions — Sell diagnostic Modems & Components — Computer programs for network optimization, change and equipment management!

Learn of In-Depth Seminars
May 21 & 22

Choose from 48 "How-To"
Conference Sessions May 23 & 24



D. Dull E. Howell D. Zuyko



L. Selwyn J. Bridges R. Strobl

Show Sponsors Include: Avant-Garde • Dynatech Data • General DataComm • Heilmann Labs • Racal-Milgo • Paradyne • Pulsecam Div., Harvey Hubbell Inc.

Exhibitors Include: Arus Corp., Datacom Management Sciences, Data Switch, Digilog, Digital Equipment Corp., Digitech Industries, Innet, Instron, International Data Sciences, NEC America, Pibronics/Wicom, Versa-Line Systems, and more!

Exhibits will be open: May 23, 9:30 - 8:00 and May 24, 9:30 - 4:00.

For Full Program Information Call 1-800-225-4698 (In Mass. 617-879-0700)
or return the coupon below to
Communication Networks — NM/TC, Box 880, Framingham, MA 01701

Please send Registration Information ☐ Please send Exhibit Information ☐

Register me for:

- ☐ Two-day In-Depth Sessions
(May 21 & 22) \$595
- ☐ NM/TC Conference
(May 23 & 24) \$295
- ☐ Four Day Full Program
(May 21 - 24) \$795

Name/Title _____
Company _____
Address _____
City/State/Zip _____
Telephone () _____

FREE ADMISSION TO EXHIBITS FOR QUALIFIED BUSINESS & TELECOM PROFESSIONALS

One word
from us
could solve
your PC
service
problems.

AMER

We've noticed that some words cause PC owners extreme anxiety. Words like "The disk drive blew..." "The data won't come up on the screen..." and "The printer won't print."



*Service for a
variety of systems.*

Well, the next time words like that are echoing in your ears, just ask

for Americare service from Xerox.

Unlike a lot of manufacturers and deal-

ers, we don't restrict our repair service to one select brand. Instead, we service 22 of them, including 82 different models. From IBM PCs to Quadram boards. And from Amdek monitors to Okidata printers.



*Repairs in
48 hours or less.*

Our technicians undergo intensive training on the equipment we service. In fact, they probably know as much about servicing it as the people who made it.

And they work fast, so in most cases they can have your PC up and running

XEROX® and Americare™ are trademarks of XEROX CORPORATION.
IBM PC™ and the IBM logo are registered trademarks of International Business Machines Corporation.
Quadram™ is a registered trademark of Quadram Corporation.

XEROX

ICARE™

again in 48 hours or less.

Of course, you can't get it back fast if the parts aren't available. Which is why we're downright obsessive about keeping our parts department well stocked:

Americare has Xerox Service Centers that provide you with a nationwide support system. And to make service even easier, you can reach us through our network of



Well stocked
parts departments.

over 3,000 authorized computer dealers.



A nationwide
support system.

In addition, we offer a choice of on-site, depot or pick-up and delivery service. Year-long service contracts or time and materials service agreements are available.

So call 800-238-2300 for the Americare dealer nearest you.

AMERICARE

PC repair beyond compare from Xerox

It's the first thing to do when you're looking for the last word in service.

MICROCOMPUTERS

LISA from page 108

original Lisa, you felt like you were in slow motion," he said. "The new machines really whip right along."

Like earlier Apple personal computers, many Macs and Lisas will enter large corporations through the back door, bought by individuals with discretionary budgets, analysts suggested. "I don't think any manufacturer can satisfy every user's needs within a company," Goldberg said. "People are going to want an alternative."

In some cases, that's official policy, according to Wagner. "Some large companies are saying 'We don't have any great problem buying several kinds of micro.'"

"But MIS/DP departments have extended themselves a lot, and

there's less of that going on now," Pollack said. "We talk mainly to two different groups in large companies. First is the front-door [approach] with the DP department. We also may go through the top door, dealing with senior-level management."

A widespread perception remains that Apple still lacks one key ingredient in the large corporation market: a determined sales effort.

However, Webb said that one important reason Apple won the Post, Marwick contract was Apple's willingness to work with the accounting firm, even long before the product was announced. "IBM was reluctant to disclose anything in advance."

"We are very pleased with the Mac deal," Webb added. "We've taken a lot of heat within the organization. I think we're being vindicated."

PORTABLE from page 91

ding software on read-only memory (ROM) chips, manufacturers like Tandy Corp. save space, but they sacrifice use of an industry-standard operating system, such as Digital Research, Inc.'s CP/M or Microsoft, Inc.'s MS-DOS. "Standard operating systems require a lot of the computer's resources to manage memory," explained Rick Myer, senior product manager at Micropro International Corp. "Most lap computers do not have the necessary resources."

Large organizations seem unwilling to sacrifice use of a common operating system for portability. "We have invested a lot of time and money training employees on different packages such as Lotus Development Corp.'s Lotus 1-2-3," Postbriant

said. "We don't want to restrain them to use a portable computer."

Lap computers have made "easy-to-carry" synonymous with "difficult-to-use." "The notebook computers are limited by small screen size and chafed-size keyboards," claimed John Duffy, vice-president of marketing at Gavilan Computer Corp.

Manufacturers like Gavilan, Grid Systems Corp. and Sharp Electronics Corp. are attempting to balance functionality and portability, offering somewhat larger products. These relatively lightweight (approximately 10 lb) machines use the MS-DOS operating system, but they are more expensive and embody sacrifices that portable computer customers must make.

Large companies are primarily interested in one type of MS-DOS software. "The key feature we look for is a portable IBM compatibility," remarked Ronald Jenks, partner and director of the information services department at Touche Ross & Co. in New York. None of the current lap systems are fully IBM Personal Computer-compatible.

While these portables offer screens larger than those found on lap-size computers, they still fall short of most users' needs. "I just couldn't run a spreadsheet program on any lap-size computer," Postbriant said. "I need 24 lines, not eight."

These computers are battery-operated, and batteries don't run forever. "Users have to realize that running an operating system uses a great deal of memory and requires a lot of battery power," Duffy said. "There are limits to what can be done." For example, Gavilan's use of a floppy disk drive and Grid's electroluminescent screen limit battery use to a few hours.

Improvements should be forthcoming soon from these and other vendors. Among the upgrades, "battery life should be longer and 25-line displays should soon be available," Duffy predicted.

This month, Micropro announced that Wordstar will be available on Epson America, Inc.'s new FX-8 lap computer, although Epson refused to discuss the machine. The FX-8 offers CP/M compatibility, a 32K-byte operating system in ROM, a 64K-byte random-access memory expandable to 184K bytes, a built-in microcassette recorder and a set of on-board ROM and cassette-based application software for approximately \$1,300. FX-8's version of Wordstar possesses most Wordstar features.

Other companies also plan to enter the market with functional lap-size computers. In March, Kaypro Corp. announced that it would sell an IBM Personal Computer-compatible lap-size computer, manufactured by a Japanese company, Mitsumi. Hewlett-Packard Co. is preparing a system that uses MS-DOS and has Lotus 1-2-3 and a word processing program encoded on ROM, while both IBM and Compaq are said to be working on lap-size computers that run IBM Personal Computer-compatible software. Apple Computer, Inc. reportedly is taking its first step toward a lap-size computer with a portable Apple IIe that uses a television screen as a monitor.

However, future products do not help current users. "We know that there will be better products available in the future," Postbriant said, "but we need a portable now."



Introducing the TI 855 microprinter. No other printer says better so many ways.

Feature for feature, no other microprinter can match the versatility, compatibility, reliability and productivity of the OMNI 800 Model 855 microprinter. Here's why.

Two Printers in One. With the TI 855 you get the speed of dot matrix draft copy. Plus the precise clarity of the most advanced matrix technology for letter-quality print. It's two printers in one—at one low price.

A Great Family Name. Texas Instruments is known for providing the world with the industry standard for printers—the TI 880. TI builds the same reliability into every 800 series microprinter. Both the 855 and the data processing Model 850 are part of the expanding TI line of high-performance, low-cost microprinters.

Hardware Compatible. The TI 855 microprinter is compatible with all major PC hardware. And it provides both serial RS232C subset and "Centronics-type" parallel as standard interfaces.

Software Compatible. The TI 855 uses industry standard escape sequences for compatibility with virtually all third-party software. And for those with proprietary software needs, a model is available with ANSI standard escape sequences.

Single Foot Modules For Quick Character Change. Three font modules can be inserted into the front of the printer at one time, and are accessed individually. Each contains both draft- and letter-quality character sets. They're easier to use, more reliable and more durable than traditional metal or plastic daisy wheels.

More Productivity Than Any Other Microprinters. The 855 offers both fiction and tractor paper feed, to handle all types of word and data processing applications. A quick-change snap-in cartridge ribbon. Raster and mosaic graphics. And intelligent printing which maximizes document throughput—pages of format.

Get the printer that makes for better information systems. For more information visit your nearest TI authorized dealer or write: Texas Instruments Incorporated, P.O. Box 402430, Dept. DIF083COW, Dallas, TX 75240. Or call toll-free: 1-800-527-3500.

TEXAS INSTRUMENTS
Creating useful products
and services for you. 2036-01

COMPUTER INDUSTRY

MAI adversaries agree on hardware upswing

By David Whelan
Of New York Bureau

NEW YORK — After their first meeting together as directors of Management Assistance, Inc. (MAI), Raymond P. Kurshan and former dissident shareholder Asher B. Edelman both said the minicomputer maker's Basic Four hardware business is on an upward swing.

Two weeks after the announcement that Edelman and his allies had won four seats on the MAI board of directors (CW, April 9), charging mismanagement of the company and vowing to oust MAI President and Chairman Kurshan, Edelman said following a board meeting on April 18 that the company's "hardware business is currently doing bet-

ter than I had realized, and I believe the trend will continue."

Edelman later told *Computerworld*, "I was pleasantly surprised. They've made inroads with this [S240] 8000 series [of minicomputers] — it's nothing extraordinary, but it's something. I'm delighted when I'm wrong."

However, Edelman added that MAI's corporate overhead expenses are \$15 million too high. "Upper management lives high on the hog, and middle management is not being properly rewarded for the work they do," he said.

In a separately prepared statement, Kurshan said new orders for the company's line of Basic Four equipment had risen 25% in the first half of the year to \$155

million. "We are confident that the MAI Basic Four operations will continue their successful growth," Kurshan commented.

The company also recently consolidated its U.S. and international sales teams under the control of the Basic Four Information Systems Division as a spur to lagging domestic sales.

Before the board meeting, MAI said it had reorganized its sales force, shuffling down its international operations headquarters in Orange, Calif., and consolidating the U.S. and overseas sales teams under the control of Stephen J. Keane, president of the Basic Four division.

U.S. sales of the company's equipment have trailed overseas sales, and the sales force shuffle is intended to spur domestic

See MAI page 126

digital

Digital Equipment Corp.'s third quarter continued the turnaround of the previous quarter, with both combining to erase the profit dip of the first quarter, and Prime Computer, Inc. reported a 19% increase in profits for the first quarter, evidently rebounding from last year's disappointments/123

Goal Systems finds success with CBT, systems software

By Paul Gilks
CW Staff

COLUMBUS, Ohio — You might say Goal Systems International, Inc. was the result of a mid-life crisis. "In 1978, I was 40 and beginning to question whether what I had done was worthwhile," said Steve B. O'Donnell, founder and president of Goal Systems. O'Donnell, who was then a manager of product development at Westinghouse, Inc., went into business for

himself in October 1978. Two months later, he finished writing Goal's first product, a library management tool called Pile for IBM DOS operating systems.

Goal Systems had sales of \$432 in 1978. In 1984, it will approach \$10 million in revenues. Goal now offers a line of 11 products for IBM OS and DOS environments, with three more on the way and a successful computer-based training (CBT) authoring and delivery system called

Phoenix. Today the company employs about 90 people.

Like many software companies, Goal's success has been due largely to a focus on carefully targeted markets. Goal is in the quiet but highly profitable systems software arena. While it doesn't offer a single flagship product, it has focused on areas in which there is no substantive competition.

"The thing about systems software is that

See GOAL page 128

Many other companies reported healthy quarterly profits, but Amdahl Corp. experienced a 16.7% decrease from year-earlier figures, as revenues increased by a mere 1.7%/136

Despite increasing regulation of trans-border data flow, multinational companies can continue to operate across borders if they cooperate with foreign regulators/123

First conviction, jail term given for copyright violations

By Peter Barabak
CW Staff

PHILADELPHIA — The U.S. attorney's office here recently obtained what is believed to be the first criminal conviction and prison sentence against an individual charged with violation of the federal copyright act in connection with counterfeit computers.

During a Federal District Court hearing March 13 on charges related to the seizure

The International Trade Commission's recent ban on imports of look-alike microcomputers is seen strengthening copyright protection. Story on page 114.

gling of counterfeit Apple Computer, Inc. Apple IIe into the U.S., Joel M. Isadore, 39, of Cornwells Heights, Pa., pleaded guilty

to a charge of conspiring to violate the copyright laws and was handed a six-month prison sentence. A codefendant, Daniel S. Ryan, 58, of Philadelphia, pleaded guilty to two counts of smuggling and was handed a suspended three-year prison term and fined \$3,000.

Two other defendants, Alfonso D. Keh, 42, and Alberto K. Chua, 41, both Taiwanese nationals residing in King of Prussia,

See SEIZURE page 126

Recession fears can't dampen good times in computer industry



INDUSTRY OUTLOOK
New Bucks
By Anne Fisher

Unstable interest rates and the gigantic federal deficit hang like a great dark cloud over much of the business community, but certain factors at play during this economic period may make the computer industry essentially recession-proof.

That is the view of Ronald T. Mahou, a senior partner with Coopers & Lybrand and chairman of the accounting firm's High Technology Industry group, which offers its services to assist companies in developing business plans and obtaining capital.

During a recent conversation,

Mahou noted several factors that may serve to keep the financial spigots flowing even if high interest rates and the federal deficit serve to dry up traditional funding sources.

A major factor, he said, are recent changes in the federal tax code. With the reduction in the capital gains tax from 48% to 20%, investment of lucrative venture capital remains attractive, even as traditional financial institutions provide higher interest rates to larger paybacks.

When almost half of an investment return was taxed, the risk of ventures as such instruments would become less attractive, as treasury certificates would climb to a level offering almost an equal effective return.

Perhaps more crucial are the

higher investment credits and faster depreciation schedules available for capital investment. For a \$500,000 equipment purchase, a business can obtain in the purchase year a \$60,000 investment tax credit and an additional \$67,500 depreciation allowance.

"Tax incentives enhance cash flow," according to Mahou, and businesses purchasing computer and automation equipment realize increases in productivity and a quick payback.

Productivity is the gospel these days among American businessmen seeking to protect their competitiveness against economic cycles and aggressive foreign traders. Even if the country were to enter another recession, Mahou believes the availability of capital combined with the tax incentives for pur-

chases and the expected demand for automation will serve to keep the computer industry on track.

In a speech in Tokyo earlier this month, Roger B. Smith, chairman of General Motors Corp., noted that the increasing competition in the worldwide motor vehicle industry is forcing the advancement of new technology.

"This has had a profound effect on the products we make, the plants where we make them and the work force that puts them together," Smith said.

"For if we manufacturers are to succeed — indeed, to survive — in the cars and the trucks of the future must be of the highest quality we can make them, and they must be built in the factory of the future by the work force of the future," he added.

COMPUTER INDUSTRY

DEC Micro/PDP-11 hits business centers

NEW YORK — Digital Equipment Corp. announced here last week its Micro/PDP-11 Team Computer is now available directly to small business users through its nationwide chain of 63 business centers.

The computer reportedly can support up to eight users at a time, with all users sharing resources and information.

Also available through DEC's retail centers is the Digital Accounting System, a package of seven integrated accounting modules: general ledger, payroll, accounts payable, accounts receivable, inventory control, order entry and sales analysis.

According to John O'Keefe, group

product manager of DEC's Small Business Group, the five-year-old business center concept attempts to provide planning and systems support that small businesses cannot afford on an in-house basis. "Unlike large companies, small businesses don't have the luxury of MIS and DP departments to provide guidance. Therefore, they need vendors who understand their businesses and who can assist them in selection, planning, training and ongoing support in order to ensure system success," O'Keefe said.

The Team Computer provides "small businesses with a clear growth path," O'Keefe said, adding

that DEC's Decmate II, Rainbow and Professional series microcomputers can be hooked up to the Micro/PDP-11 model.

He said small businesses can obtain an integrated system for less than \$20,000 and receive support from DEC.

The basic configuration, priced just under \$20,000, includes a Micro/PDP-11 system unit with a 10M-byte Winchester hard disk drive, 512K bytes of internal memory, two VT220 terminals, one LA100 printer and dual 400K-byte floppy diskette drives.

DEC is located in Maynard, Mass. 01764.

NTT announces acquisition of AT&T minis

NEW YORK — Nippon Telegraph & Telephone Public Corp. (NTT) said here recently it has signed a \$40 million contract to buy 60 of AT&T's 3820 minicomputers to be installed in regional switching offices in Japan.

According to a spokesman, the contract includes the 60 computers and a number of display terminals. The equipment will be used in NTT's Advanced Traffic Observation and Management Information Collection System, an on-line system for collecting traffic data and transferring the data to a central computer.

NTT signed a letter of intent for the hardware last October and has been negotiating with AT&T International, a unit of AT&T, since then, the spokesman said. He added that the contract represents one-third of NTT's budget for U.S. equipment purchases in the current fiscal year.

Announcing The Computer Show that takes the work out of going to computer shows

The first PC World Exposition for Chicago sponsored by PC World Magazine. It's the only computer show designed for the busy professional on a hectic schedule.

While other computer shows invite you to spend time learning about computers, we invite you to save time. And save money.

Of course, you'll find scores of exhibits, featuring all the most important state-of-the-art personal computing products — the hardware, software, printers and peripherals changing the face of American business. Products from IBM, DEC, Compaq, Lotus, Hewlett-Packard, Epson, Apple, VisiCorp, and many more.

You'll find three days of information-packed conferences designed to help you choose and use the latest of the new technologies. Sessions led by acknowledged experts — the people making the headlines and headlines of the most respected computer press.

Plus, we'll make sure you don't waste a minute of your precious time wandering around the show hall looking for the exhibits or conferences you've been wanting to see for months. The PC World Exposition format is streamlined for you. Exhibits are easy to find, conferences are scheduled at suitable times.

Put simply, the PC World Exposition is the computer show run by professionals, for professionals. Why waste a day or a single dollar at any other show?

Following is a sampling of the conference sessions:

- Introduction to Personal Computer Communications

- DP/MIS Forum: Industry Issues in Corporate PC Use
- Compatibility Issues for the Corporate PC User
- The Anatomy of the IBM PC: A User's Guide to Components and Functions
- The PC as the Basic Small Business Information System
- Selling to the Corporate Account
- Project Management Software
- Integrating Business Applications in the Corporation: Word Processing/Spreadsheet Applications
- The IBM Family Tree from PCjr to the 287
- Investment Software for Individuals and Small Businesses
- Local Networks for PCs
- Manufacturing Resource Planning with the PC
- Integrating Business Applications in the Corporation: Data Base Management/Business Graphics Applications
- Inventory Control and Shipment Applications
- What's New in Portable and Kneetop Computers

Featured Speakers:

William Dean, President of Columbia Data Products
 "The Effect/PC Industry: IBM Domination and Future Directions," David Bunnell, Publisher of PC World magazine
 "PC Basics: An introduction to Personal Computing," John Gans, Editor of Tech Street Journal
 "Survival Strategies for the PC Marketplace"

Sponsored by PC World magazine

PC
WORLD EXPOSITION

June 13-15, 1984
 Donaldson Hall
 at McCormick Place West
 Chicago

Registration and Exhibits
 9:00 a.m. to 5:00 p.m.
 and Friday 9:00 a.m. to 5:00 p.m.

Take \$5.00 off the price of your ticket.

Save \$5.00 on admission to the entire show and conference program, June 13-15, or admission to the full three days of exhibits. Just clip this coupon and hand it to the cashier. Regular price for the entire show and conference program is \$35.00; admission for exhibits only is \$10.00.

Deposits on this coupon are not acceptable; coupon is not redeemable for cash. One coupon per person. Credit cards are not accepted. The PC World Exposition is produced by World Expo Co. and managed by World Expo Associates. For further information, call World Expo Associates at (800) 345-1400 or (312) 399-0000.

PC World Exposition is a registered trademark of World Expo Co. ® applied company's trademark. ® applied company's registered trademark.

IAS awarded \$1.4 million in Zenith suit

GRAND RAPIDS, Mich. — A Federal district court judge here recently awarded \$1.4 million in damages to Information Access Systems, Inc. (IAS) against two subsidiaries of Zenith Radio Corp. following a jury verdict that the Zenith units failed to use "best efforts" in distributing an operating system and application software.

An attorney for Zenith, Jeffrey Birkhead of the Grand Rapids law firm of Warner, Norcross and Judd, said Zenith would present motions to the court seeking a new trial and asking the judge to reverse the jury's decision. He declined to comment on the merits of the case.

IAS was represented by Peter Brown, of the New York law firm of Brown, Rayman and Milstien, and Michael Fayette, of the Grand Rapids firm of Kleiner, DeYoung & Fayette. Brown called the decision a landmark in that it involved the first interpretation of the "best efforts" standard of marketing computer software.

IAS President William Brady reportedly testified in court that he had a contract with Zenith Co. for distribution of his Diver operating system and business application software with Zenith's WR-11 microcomputer. Zenith was acquired by Zenith Radio in October 1979, and subsequently Zenith Data Systems and Heath stopped all marketing efforts for the IAS software.

The suit was tried for three weeks last December before a six-man jury, which returned a verdict in favor of IAS on Dec. 20. Judge Benjamin F. Gibson subsequently entered a judgment awarding IAS damages of \$1.3 million and interest of \$94,877 and ordered IAS to pay \$42,074 to Zenith and Zenith Data Systems on a counterclaim.

COMPUTER INDUSTRY

Valid Logic inks CAE pact with Siemens

MOUNTAIN VIEW, Calif. — Valid Logic Systems, Inc., a manufacturer of computer-aided engineering (CAE) workstations based here, announced recently the signing of a three-year technology cooperation agreement with the corporate information technology division of Siemens AG, the West German electronics firm.

Under terms of the agreement, Valid Logic and Siemens will cooperate to develop software products and to interface Valid Logic's CAE workstation to Siemens' computer-aided design (CAD) tools for electronic development and to its mainframe computers. Additionally, the companies will seek to adapt Siemens' CAD tools to Valid Logic's workstations.

More specifically, the two firms have agreed to work jointly to interface Valid Logic's workstations to Siemens' Vetus and ES 9000 systems. The two companies also will share their design libraries. Valid Logic and Siemens will cooperate in the area of workstation software, including adapting Siemens' software to Valid's workstations and vice versa.

Tom Lawrence, vice-president of European sales at Valid Logic, said the agreement "is a perfect example of how a large company can take advantage of state-of-the-art, Unix-based workstation technology without losing the major investment that it has already made in its own system."

Valid Logic said that during the next three years, it expects Siemens to become a volume customer as well as a partner in the joint agreement. The company noted that Siemens employs more than 30,000 electronics engineers and scientists in research and development activities, many of whom could utilize Valid Logic's CAE workstations.

DEC, Prime, Harris show profit increases

Digital Equipment Corp. last week announced third-quarter profits were up \$83 million over last year, continuing the firm's second-quarter turnaround, and Prime Computer, Inc. reported a first-quarter profit increase of 19% over last year, a rebound from the 27% dip reported for fiscal year 1983. Harris Corp. last week reported third-quarter profit from continuing operations was up 27% from the previous year.

DEC announced that profits for the quarter were \$101.8 million, or \$1.77 per share, compared with year-earlier profits of \$79.7 million, or \$1.40 per share; revenues for the quarter were \$1.63 billion, 31%

ahead of last year's \$1.09 billion. For the nine months ended March 31, DEC posted profits of \$168.1 million, just ahead of last year's pace of \$197.8 million, but effectively overcoming a dismal first quarter, when profits dipped to \$15.9 million, or 72% below the level of the previous first quarter.

At Prime, where the previous quarter's profits had lagged behind year-earlier profits by \$12.1 million and the fiscal year 1983 profits were \$12.4 million below the 1982 level, the company reported first-quarter profits of \$10.1 million, or 21 cents per share, a 19% increase over the \$8.5 million, or 18 cents per share, re-

ported in the first quarter of 1983. Revenues increased to \$146.6 million, up 21% over the \$120.5 million reported a year earlier.

Harris Corp. reported third-quarter profits of \$16.8 million, or 50 cents per share, from continuing operations, up 27% from last year's \$17.7 million, or 40 cents per share; sales revenues were \$502.5 million, up 8.7% over the same period a year earlier. Sales and profits for the first quarter and prior year were restated to include the results of Lanier Business Products, Inc., which was merged into Harris during the second quarter and whose results were not shown separately.

Honeywell signs trade contract with China

WALTHAM, Mass. — Honeywell, Inc. has signed its first computer distributor contract with China, a three-year agreement potentially worth up to \$10 million, a company spokesman said.

The agreement with the Great Wall Industrial Co., the trading unit of China's Ministry of Space Industry, allows Great Wall to market Honeywell's DPS 6 small business and minicomputer systems through the Data Equipment Institute in Peking.

Honeywell said it has received orders so far totaling \$1.2 million for DPS 6/45 and DPS 6/75 systems, along with computer terminals, printers and mass-storage devices.

Included in the orders was Honeywell software for data communications, data base management and data entry applications, as well as Cobol and Fortran language compilers, according to the company.

COMPUTER INDUSTRY

Import ban of micro copies adding to copyright security



OUTSIDE LINES
Jonathan D. Wallace

Early this year, the U.S. International Trade Commission (ITC) announced its decision to ban the importation into this country of microcomputers described as look-alike versions of machines produced by Apple Computer, Inc.

The decision, widely reported at the time, spurred much speculation as to whether the ITC intended also to ban the importation of machines that do not in themselves infringe on

any Apple patents or copyrights, but which, once inside the U.S., are fitted with circuits or read-only memory (ROM) chips containing infringing material.

The ITC's 48-page opinion, finally issued on March 9, settles this question and also makes some interesting contributions to the American law of copyright as it pertains to computer software.

Apple knockoffs

Apple Computer, Inc., based in Cupertino, Calif., filed its complaint with the ITC in January 1983. Apple accused 20 companies, including 16 located in the Far East, of importing

Apple knockoffs into the U.S. Only two of the accused companies participated in the hearings eventually held by the ITC.

Dr. Paul T. Hulina, an associate professor of electrical and computer engineering at Pennsylvania State University, testified on behalf of Apple.

The ITC found many of the look-alike machines to contain ROM chips that incorporated Apple's copyrighted Autostart and Applesoft programs.

On some of these, a single line of code had been rewritten so that the name of the manufacturer would come up on-screen at initiation of the

program instead of the Apple name and logo. Certain other components were imported with the ROM chips missing, and these were then inserted once the machines were in the U.S.

The ITC, relying on the doctrine of "contributory copyright infringement," banned these machines. It found that since these machines had motherboards identical to the Apple, only ROM chips containing Apple boot-up, operational and interpreter programs, such as Autostart and Applesoft, would make these machines work properly.

Software already available

The ITC's own investigative attorney had argued that the ROM-less computers could not be held to contribute to copyright infringement because software available from Apple itself could be run on them. Applesoft is available on disk, and the ITC heard testimony that Autostart, formerly manufactured by Apple as a card insert, was still available from certain dealers.

The ITC glossed over this point, stating merely that there was insufficient evidence in the record to indicate that these Apple products had ever actually been used with the ROM-less computers to make them operational.

It concluded that all of the ROM-less machines involved in its investigation were intended to be completed by the insertion of illegal chips. The ITC, therefore, included the ROM-less machines in its order banning Apple knockoffs from importation into the U.S.

Collins' Debono chip

Perhaps the most complicated problem the ITC faced was that of the Collins International Trading Corp. Debono ROM chip, which was inserted in Collins' Orange + Two computer after importation. Whereas all of the other offending chips the ITC studied contained straightforward copies of Apple programs, with one or two lines of code changed to delete the Apple name and logo, the makers of the Debono ROM had gone to the trouble of substantially rewriting the Autostart program.

The ITC, therefore, found itself in relatively uncharted territory, trying to determine how much original work will transform a copyright infringement into a noninfringing new creation.

The U.S. copyright law, while protecting the overall work, does not necessarily protect the work's components.

Since software pirates are typically lazy, changing at most a byte or two, this question has not frequently arisen.

It can be expected to be of greater importance in the future as changes in the law cause the lesser pirates to drop out and the remaining ones to become increasingly devious and clever.

See ITC page 126



Only Texas Instruments packs more portable terminal into less space.

Here's a brief case for the Texas Instruments Slave 700™ Model 707 Portable Data Terminal. It's the least and lightest in a long line of standard-setting Slave 700™ terminals. And it's the most versatile full-function portable anyone can pack into a briefcase.

By carrying TI's Model 745 one step further, we made the best ever before. The 707's standard internal

modem connects to any telephone network while the optional acoustic coupler and battery pack make it fully portable. The spreadsheet-size 132-column printer is now standard. And TI's solid state plug-in cartridges can add functions for your current use and later expansion.

For the standard-setting terminal that packs more product into less space, get the TI Model 707. At only six pounds, it packs more full-size

functions than any other portable... all at a surprisingly low price. For more information contact: Texas Instruments Incorporated, P.O. Box 423430, Dept. DTB-1630W, Dallas, Texas 75240. Telephone 1-800-527-3500.

**TEXAS
INSTRUMENTS**

Creating useful products
and services for you.

Jonathan D. Wallace is a partner with the New York law firm of Meitz, Wallace and Russo and author of "Understanding Software Law," a Handy Guide booklet published by the Alfred Co.

COMPUTER INDUSTRY

Inman urges U.S. industry to pool R&D

By David Meyers
Of New York Times

NEW YORK — Joint research ventures may be America's answer to the Japanese practice of pooling research talent from rival companies, according to the president and chief executive officer of the computer industry's first such joint venture.

Adm. Bobby Inman (IBM Int.) of the Austin, Texas-based Microelectronics and Computer Technology Corp. (MCC) told an audience at a Japan-U.S. trade conference here earlier this month that joint research ventures may also be the only sure way to develop the talented researchers American business needs to remain preeminent in technology.

"In the 1960s American business adopted cost-effectiveness as its new value. While cost-effectiveness may have served our business interests, it has served us very poorly as a society as a measure of developing talent," Inman said.

Later in the same decade — in 1968 — the U.S. Department of Defense stopped awarding grants in aid to graduate students in the sciences, in mathematics and engineering, Inman pointed out. A little later, in 1974, the Japanese hit upon the idea of pooling researchers from competing firms, and since then, the "mechanics of using scarce talent to create new technologies" has been dominated by Japan, he said.

Antitrust laws prevent American industry from setting up research groups staffed with the laboratory whizzes from rival manufacturers, but Inman pointed to a loophole in the laws that permit an independent research unit to be funded by the rivals — as long as the research unit does not bring a product to market.

"If you could envisage a product, its [research and development] should not go to MCC. You haven't a clue what product may eventually emerge from [long-range research] when you begin," Inman said.

MCC is now involved in four areas of basic research: artificial intelligence, data base management software, the human interface with computers and parallel processing. The research corporation is funded by 14 different computer firms, and Inman said dealing with that many corporate shareholders "is like being back dealing with NATO."

The investor companies promise to fund one major area of research for at least three years, and any new technologies developed by MCC then belong to the original shareholders for another three years, according to Inman. After that any other company that wishes to may take out a license on the patent, but a portion of the royalty payments go straight to MCC's lab workers as a reward, Inman said.

Inman urged the corporate executives at the trade conference to enter into a research collaboration with the American university. "I think that's essential, but it will take beefing up the university end. And it will take additional investment in higher education — but not at the expense of the liberal arts," Inman said.

M/A-COM pushes AT&T net software

WASHINGTON, D.C. — At April's annual Federal DP Expo, one large vendor who is new on the block — AT&T Technologies — was not present to push its new line of 386 and 386 office computers and related networking applications software. Instead, the only vendor pushing AT&T's office products was M/A-COM Sigma Data, Inc., a subsidiary of Massachusetts-based M/A-COM, Inc.

Richard Litinger, president of M/A-COM Sigma Data, proudly asserted that his company is the first value-added reseller picked by AT&T Technologies to push its new line of products, based on the Unix System 5 operating system. Litinger's compa-

ny is responsible for picking and screening application software programs that will run on the 386s and the 386s.

It is also the only licensed dealer in the Washington, D.C., area that can sell AT&T's new line to the federal government. "Being the exclusive supplier, we have to sell it as a full office-oriented application," commented Litinger, who said M/A-COM Sigma Data has a successful record in that area. It is just completing the installation of a \$10.5 million office automation contract at the Internal Revenue Service.

Regarding the new AT&T 386 line being sold by his company, Litinger

said that last fall, an unidentified official of AT&T Technologies entered his office and said that he represented a company with over \$1 billion in sales seeking a foothold in the government sales arena.

"I almost threw him out of my office, but curiosity prevailed and it led to our contract with AT&T," Litinger said.

"At first my main concern [with the 386 line of products] was how [AT&T] was willing to price it ... [AT&T] has realized what we must do, and it knows that it has to have something that will sell in the \$5,000 per terminal range — and we will soon have that," he added.



COMPUTER INDUSTRY

Burroughs' profits rise 25%

DETROIT — Burroughs Corp. recently announced first-quarter financial results reflecting a 35% increase in profit and 10% increase in revenue over the same period a year earlier.

Burroughs reported profit of \$43 million, or 96 cents per share, compared with \$34.3 million, or 70 cents per share,

for the comparable period in 1983.

Total revenue for the quarter was \$1.00 billion, compared with \$1 billion a year earlier.

Reflecting the industry shift away from rental income, the company reported that outright sales increased 30% and rental revenues de-

creased by 12%. Service revenues increased by 3%.

Burroughs reported that worldwide orders continued at the record levels experienced in the first and fourth quarters of 1983 and said that orders were up in all major operating groups except in the large government sector.

Amdahl profits down, revenues up only 1.7%

SUNNYVALE, Calif. — Amdahl Corp. reported a 16.7% drop in profits from current operations for the first quarter ended March 30, as revenues climbed a mere 1.7% over the comparable quarter in 1983. Amdahl reported that revenues for the

quarter were \$174.5 million, compared with \$171.6 million a year earlier.

Total profit for the first quarter of 1984 was \$7.3 million, or 17 cents per share, but income before an extraordinary credit was \$4.9 million, or 12 cents per share. For the first quarter of this year, profit was \$4.1 million, or nine cents per share, reflecting a 43.8% drop from the total first-quarter 1983 profit and a 16.7% drop from the first quarter of 1983 before application of the extraordinary credit.

John C. Lewis, Amdahl president, said the results were lower than anticipated, and some of the negative factors affecting profits are expected to continue in the second quarter.

But, he added, "We believe that most of these issues will be resolved in the second half of the year, when new products and features should provide us with the opportunity to show annual earnings improvements over the record results of 1983."

Raytheon shows hike in profits

LEXINGTON, Mass. — Raytheon Co. recently reported first-quarter profits of \$79.2 million, or 94 cents per share, an 8.6% increase from the \$72.9 million, or 86 cents per share, reported during the comparable period last year.

The company reported first-quarter sales of \$1.5 billion, a 14.5% increase, compared with \$1.3 billion in sales a year ago.

The company said electronics products, its largest business, continued to account for the largest portion of sales and earnings. A strong performance from long-term, military-related contracts was partially offset by a continuing "unfavorable performance" in commercial data processing, the firm said.

SourceTools Increases
Programmer Productivity

Oregon
Software

03-541 3001



COMPUTER INDUSTRY

TI rebounds in first quarter

DALLAS — Texas Instruments, Inc., continuing its rebound from last year's troubles with its home computer line, reported recently that its first-quarter profits rose more than 10 times over the same period last year. Revenues increased 14% to \$1.23 billion, compared with \$1.17 billion a year earlier.

The company reported that first-quarter profits rose to \$79.9 million, or \$3.23 a share, from \$7.1 million, or 30 cents a share, a year earlier, when sales of its home computers were depressed because of potential shock hazards in the machines' transformers.

First-quarter 1984 earnings were increased by about \$9.9 million, or 41 cents per share, from the sale of home computer inventories that were

written off when the company withdrew from the home computer market last October, the company said. J. Fred Bucy, president and newly elected chief executive officer, said the company completed shipment of its home computers during the first quarter, but that it may realize more gains in future quarters from sales of the written-off machines.

Bucy said the company's first-quarter profits were largely attributable to record orders and shipments of its semiconductor products. He said demand during the first quarter was particularly strong for MOS dynamic random-access memory chips and bipolar digital circuits.

Gould announces 33% increase in profits for recent quarter

ROLLING MEADOWS, Ill. — Gould, Inc. recently reported that its first-quarter profits from continuing operations increased 33% to \$30.5 million, or 46 cents a share, compared with \$18.5 million, or 36 cents a share, for the corresponding period in 1983.

The company reported first-quarter sales from continuing operations were \$363 million, about a 16.8% increase over \$311.6 million a year ago.

Discontinued operations in the first quarter had a net loss of \$900,000, or 2 cents a share, compared with a net loss of \$3 million, or

4 cents a share, in 1983.

The company also reported that orders received during the first quarter increased by about 35% over a year ago. Backlogs increased to \$708.4 million, up 24.6% over \$686.7 million during the same period in 1983.

William T. Tivins, chairman and chief executive officer, said the increased profits were attributable to "very strong gains in Gould's factory automation operations, as well as improved results from our electronic components, test and measurement and defense systems operations."

Apollo registers quarterly gain

CHELMSFORD, Mass. — Apollo Computer, Inc. recently reported first-quarter 1984 revenues of \$35.5 million, an increase of more than 250% over revenues of \$14.1 million during the same period last year.

The company's profits for the first quarter was \$4 million, or 13 cents a share, compared with first quarter 1983 results of \$1.7 million, or 6 cents a share, plus an extraordinary tax credit of \$727,000, or 3 cents per share. All per-share amounts have been adjusted to reflect a three-for-two stock split payable last Feb. 29.

"The high rate of growth in both net sales and earnings results from a continuing strong demand for our new and existing products," said John W. Poduska Sr., chairman and chief executive officer.

Revenues rise at Honeywell

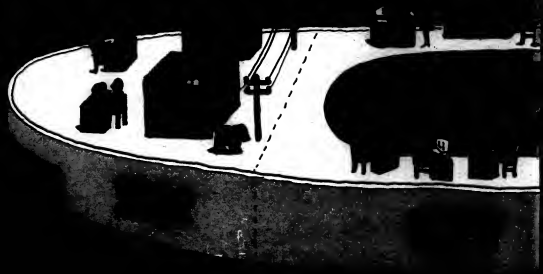
MINNEAPOLIS — Honeywell, Inc. reported a 71% increase in profits during the first quarter, with earnings reaching \$39.6 million, compared with \$22.2 million for the same period a year ago. Earnings per share were 84 cents compared with 48 cents for the same period a year earlier.

Honeywell's worldwide sales, rental and service revenue was \$1.39 billion during the first quarter, a 5.2% increase over \$1.32 billion in revenue in the same period last year.

Edson Spencer, chairman and chief executive officer, attributed the company's robust quarter to a very strong U.S. economy. He observed that the company's domestic results were improved from levels a year earlier and added that his company's international results also showed some growth, but at a slower rate.



More financial reports are summarized on page 120.





COMPUTER INDUSTRY


**NEWS
AND NOTES**

Terminix Data Corp. reported revenues for the second quarter of 1984 were \$11.3 million, compared with \$6.4 million a year earlier. Profits for the quarter were \$318,000, or 30 cents per share, compared with \$549,000, or 14 cents per share, in 1983.

Manhattan Corp. reported profits for the first quarter ended March 30 were \$5.9 million, or \$1.35 per share, compared with \$4.3 million, or 90 cents per share, in the first quarter of 1983. Sales for the first three months of 1984 were \$153 million, compared

with \$146 million a year earlier. Prior-year results included \$7 million in net sales for a South African subsidiary sold in May 1983.

Computer & Communications Technology Corp. announced revenues for the first quarter ended March 31 of \$27.5 million, 61% higher than 1983. Profits before an extraordinary tax benefit were \$2.3 million, or 30 cents per share, as compared with \$2.8 million, or 4 cents per share, in 1983. An extraordinary tax benefit of \$291,000, or 4 cents per share, increased the 1984 net income to \$2.6 million.

Integrated Software Systems Corp. reported revenues for the first quarter ended March 31 of \$5.9 million, up 39% from revenues of \$4.2

million in 1983. Profits for the quarter rose 80% to \$247,000 from \$154,000 for the first quarter of 1983.

NBI, Inc. reported revenues for the third fiscal quarter increased 97% to \$45.3 million, compared with \$23 million reported last year. Profits for the third quarter were \$4 million, compared with a loss in the third quarter of the previous year.

Prodigy Systems, Inc. has reported net sales for fiscal year 1983 rose 56% to \$13 million, compared with \$8 million in 1982. Income totaled \$115,000, or 9 cents per share, compared with the previous year's \$116,000, also 9 cents per share. Sales for the fourth quarter ended Dec. 31 amounted to \$3.7 million,

compared with \$3.4 million in fourth-quarter 1982. Net loss for the period was \$165,000, compared with income of \$17,000, or 1 cent per share, in 1982.

Ungermann-Bass, Inc. announced revenues for the quarter ended March 31 of \$10.8 million. Profits were reported at \$464,000, or 5 cents per share.

Priam Corp. reported profits increased to \$1.6 million, or 10 cents per share, compared with \$770,000, or 7 cents per share, a year earlier. Quarterly revenue was \$20.8 million, up from \$17.5 million in 1983.

Xidex Corp. reported sales for the quarter ended March 31 were \$44.1 million, an increase of 70% over \$25.8 million a year earlier. Total net income, including nonrecurring items, for the nine months ended March 31, was \$16.5 million, up 86% from 1983.

EASTERN'S SPRINT.
WHEN IT DEFINITELY, UNQUESTIONABLY
HAS TO BE THERE TODAY.

Door-to-door delivery available for an additional charge. Call toll-free at 800-334-0336.

*Guaranteed same-day delivery requires that package be on a flight scheduled to arrive before midnight.

MSA reports quarter profit

ATLANTA — Management Science America, Inc. (MSA) last week reported a first-quarter profit, considered by the company to be good news because the first quarter generally produces a loss due to DP buying patterns.

Profit for the quarter was \$484,000, or 3 cents per share, compared with a loss in the first quarter of last year of \$2.3 million, or 17 cents per share. Operating revenues rose a record 68% to \$131.2 million, compared to \$19.2 million in the comparable period in 1983.

John F. Imley Jr., chairman and chief executive officer of MSA, expressed his pleasure with the results and said they resulted from "a more aggressive first-quarter approach." Revenue growth was more than 50% in foreign operations and more than 70% in domestic operations, he said.

Wang revenues rise 30% over '83

LOWELL, Mass. — Wang Laboratories, Inc. recently reported profits and revenues for the third quarter ended March 31 were both up more than 30% over the comparable period a year earlier.

Profits were up 35% to \$49.5 million, or 36 cents per share, compared with \$36.8 million, or 35 cents per share, in the comparable period of 1983. Revenue for the quarter was \$643.5 million, up 35% from the \$504 million reported a year ago.

Strong order rates shown in the previous six months continued during the third quarter across all product lines.

For the first three quarters of fiscal year 1984, Wang reported total revenue of \$1.67 billion, and if the fourth-quarter results continue at the present growth rate of 30% or more, the company would experience an excess of \$2 billion in total revenues for the fiscal year.

IF YOU MISS CW OFFICE AUTOMATION IN THE NEXT SIX MONTHS, LOOK AT THE ISSUES YOU'LL BE MISSING.



JUNE

Microcomputers.

How they've changed
the workplace.

What's new in networks, security,
and micro-to-mainframe links.
Closes May 4.



AUGUST

Applications Software.

A look at the real issues.
Productivity. User-friendly vs.
ease-of-use. Plus plenty of
product reviews.
Closes July 6.



OCTOBER

Workstations. We explain the
alternatives to microcomputers,
addressing important topics like
cost-effectiveness, compatibility
and upgrades.
Closes August 31.

Office Automation is ideal
both for the advertiser and
the reader. Because each one
offers focused, in-depth infor-
mation in the area of office
automation.

Readers always want to
catch up on what's hot and
what's not in their particular
specialty. And find out what
the vendors have to offer.

As an advertiser, you won't
want to miss the opportunity
to tell them.

Maybe that's why our OA
is so popular.

Everyone wins.

For more information, or to
reserve your space in any of
our upcoming issues, simply
call the sales office nearest
you. Or fill out and return
the coupon to Ed Marecki,
National Sales Director, Com-
puterworld, 375 Cochituate
Road, Box 880, Framingham,
MA 01701.

To: Ed Marecki, National Sales Director
CW Communications/Inc., Box 880, Framingham, MA 01701
Please send me advertising information on: ☐ Workstations.
☐ Applications Software. ☐ Microcomputers.
☐ Please have a sales representative call me.

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone _____

Computerworld
OFFICE AUTOMATION

Sales offices

BOSTON: 375 Cochituate Road, Box 880, Framingham, MA 01701 (617) 879-8700; CHICAGO: 2808 South River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433; NEW YORK: Paramus
Plaza I, 140 Route 11 North, Paramus, NY 11762 (516) 967-5336; ATLANTA: 1851 Peachtree Road, Suite D, Atlanta, GA 30338 (404) 394-9758; SAN FRANCISCO: 300 Broadway, Suite 30, San
Francisco, CA 94133 (415) 426-7336; LOS ANGELES: 18008 Sky Park Circle, Suite 280, Irvine, CA 92714 (714) 268-2230.

COMPUTER INDUSTRY

U.S. to Japan: Trade barriers down before relations up

By David Ingram
CIV New York Bureau

NEW YORK — To promote better trade relations with the U.S., Japan must lower import barriers, tie its interest rates to international fluctuations and take up a larger share of the cost of defending the free world, American corporate executives and government officials told their Japanese counterparts at a conference here earlier this month, titled *Growth and Competitiveness in High Technology Industries*.

In turn, the U.S. must steel itself against a return to protectionism so that it might learn something from the triumphs of Japanese industrial

policy, according to Japanese speakers representing the government of Prime Minister Yasuhiro Nakasone, as well as Japanese business.

"There is an inevitable friction between [the U.S. and Japan]. We are customers of each other, and we are competitors. But it would be a mistake for us in the United States to cast Japan as the cause of our trade problems," Edison Spencer, chairman and chief executive of Honeywell, Inc., told conferees of the Japan Society here, the 77-year-old sponsor of the conference.

The U.S. trade deficit ballooned to \$39 billion in 1983 and could reach \$60 billion this year, according to

Pete Peterson, former secretary of commerce under President Nixon. Peterson blamed the swing from a \$13 billion trade surplus in 1981 on a "misalignment" in the rates of currency exchange that overvalues the dollar by 20% to 25%.

But a cornerstone of Japan's industrial policy is the encouragement of aging smelting industries to invest in foreign manufacturing facilities, according to Naohiro Amaya, special adviser to the Japanese Ministry of International Trade and Industry.

Amaya also said that Japanese industrial policy calls for the "creative restructuring" of failing industries

in order to enable the nation's economy and work force to "shift to a new industrial structure without friction and chaos."

The Tokyo government's role in industrial planning is also one of providing some guidance to companies involved in research and development "in order to eliminate redundancy of research efforts." Tokyo promotes joint research projects between Japanese firms "to pool scarce resources."

But Americans speaking at the conference pointed out that antitrust laws in this country make adoption of a centralized industrial policy unlikely.

"For legal as well as historic reasons, our government cannot participate in industrial restructuring, which makes it more painful for us," Honeywell's Spencer said.

D. Bruce Merrifield, assistant secretary of commerce, called for Congress to provide U.S. companies with tax incentives to develop technology to keep pace with Japan and other foreign industrial powers.

Real 'Achilles' heel'

But America's real "Achilles' heel" is its antitrust laws, which "prevent our companies from collaborating in order to compete in the world market," he said.

Antitrust laws, first drafted early in the century to prevent any one company from dominating the U.S. market for a product, have putnied their usefulness, according to Merrifield.

Executives representing Northern Telecom Ltd., Honeywell, Fujii Xerox Co., Westinghouse Electric Corp. and Mitsubishi Electronics America indicated Japanese businessmen fear protectionist measures as much as American executives resent trade barriers.

HUGHES
THE PEOPLE BEHIND ADVANCED
MISSILE ENGINEERING

SEEK PERFECTION

Talented... determined... proud. The people behind Hughes Missile Systems Group challenge themselves at the leading edge of technology. In an environment that both stimulates and actively supports a diversity of technical contributions. Scientific resourcefulness... coupled with creative engineering. These people have made it an art. At Missile Systems Group, Hughes people have been involved for over 30 years in the development of advanced tactical guided missile systems. They are implementing technologies to develop increasingly "smarter" weapons. Meeting national defense needs. And

maintaining a strong leadership position in the guided missile field. At Hughes, there is a stimulating relationship between the people and their work. Between the individual and the team. It's a relationship that provides opportunity for substantial individual contribution. A relationship that considers personal development to be a key ingredient. That's what Hughes Missile Systems Group is all about. People. People with integrity, vision and dedication. People participating in extraordinary ways. People like you. Current openings:
• Electro-Optical

Engineers • Missile System Analysts
• Software Designers
• Radome Analysts & Designers • High Power Transmitter Designers
• Power Supply Design
• Hybrid Process Engineers • MIC Fabrication/Packaging
Send your resume to:
Hughes Missile Systems, Engineering Employment Dept., WC-8D, Fallbrook at Roscoe, Canoga Park, CA 91304.

HUGHES
HUGHES AIRCRAFT COMPANY
Proud of U.S. Citizenship Required.
Equal Opportunity Employer.

Uninet, CDC set R&D pact

KANSAS CITY, Mo. — United Telecommunications, Inc. and Control Data Corp. have announced a joint venture for the research and development of data communications network technology. The joint effort will be known as Uninet Research and Development Co. (URDC).

Under the agreement, Uninet, Inc., United Telecom's data communications network subsidiary, and CDC will design and develop Uninet II, a public packet-switched asynchronous and asynchronous network. The technology also could be used in private nets, a spokesman said.

Uninet will have an 80% interest and will assume management responsibilities in URDC; CDC will have a 20% interest. The company will employ about 60 people, most of whom are presently affiliated with one of the participating firms.

The company will be directed by a partnership committee consisting of William T. Earey, president of United Telecom Communications; C. Thomas Taylor, president of Uninet; and David P. White, vice-president of data services for CDC.

MISSILE SYSTEMS GROUP

Speaker: Data flow controls needn't inhibit multinationals

By John Wheeler
CIB Washington Bureau

WASHINGTON, D.C. — Despite increasing regulations abroad of transborder data flow, multinational companies can continue to operate across borders if they take a cooperative attitude toward foreign regulators, according to an international telecommunications and information policy consultant.

G. Russell Pipe, president of Transnational Data Reporting Service, told a recent seminar here that, contrary to popular belief, foreign telecommunications regulators are not interested in stopping data flows. Rather, he said, they seek to control

them for various reasons, not the least of which are to make money and increase the usage of national data networks.

Corporations that understand the objectives of the countries in which they seek to do business, "avoid confronting authorities with patently unacceptable requests" for operating privileges and comply with host country regulations "will not be unduly harmed by foreign telecommunications and information policy," he said.

"Understanding, reasonableness and compliance... will gain most multinationals the solutions to their problems," Pipe said. He advised

companies not to rely on their own governments to represent business interests abroad. This is particularly true in the U.S., where the government generally espouses a noninterventionist approach to trade, he added.

Foreign telecommunications and data regulatory do not seek to stop data flows, Pipe said, "rather they seek to impose technical, economic and/or bureaucratic conditions on offshore services and data experts." According to Pipe, "The name of the game is to understand the rules."

Pipe noted that "telecommunications has been regulated since day one," and added that the information

age is going to bring "new or revised laws and policies... in every country to protect the interests of individuals, companies and states themselves."

He said this does not mean companies are not threatened by rules. He said the actual threats are: loss of confidentiality of data through government reporting, disclosure or inspection requirements; less than optimum international telecommunications efficiency for companies; added costs from new administrative requirements; taxes; and excess and redundant data processing facilities in countries whose governments insist

See POLICY page 129

Telecom policy encouraged

WASHINGTON, D.C. — G. Russell Pipe, international telecommunications and information policy consultant, said corporations should develop comprehensive policies and procedures to handle worldwide telecommunications systems and then work carefully with local governments to implement their systems in accordance with local laws and regulations.

Internal corporate actions to achieve that end, he said, should include:

- Developing coordination among relevant company departments for sharing information, making regulatory impact analyses and implementing policies.

- Conducting audits and inventories of intracompany data flow. Audit who has access to what data, when and why, and inventory what data is handled and why.

- Considering the allocation of information resources management responsibilities. "Somebody should know what you're doing and what you have" in terms of information processing and transmission, he said.

- Establishing policies addressing immediate problems and preparing long-term strategies and compliance actions in response to foreign regulations and policies. These should include professed adherence to principles of privacy protection and data security similar to those developed by various international organizations, such as the Council of Europe and the Organization for Economic Cooperation and Development.

Once these and other related actions have been taken, Pipe said, there are a number of external actions companies should take to ensure their plans and policies are effectively implemented in the various countries in which the firms wish to operate, including:

- Obtaining sufficient knowledge about foreign regulatory developments and trends.

- Directing managers in foreign subsidiaries to provide "on-the-ground" reports about local conditions and to make contacts with

See POLICY page 129

Introducing

MACWORLD

The Macintosh Magazine



The Exciting New Magazine for the World's Most Creative Personal Computer—the Macintosh

At Special Charter Subscriber Rates
Save Up to 54% Off the Newsstand Price*
(*when you subscribe for 5 years)

Personal computing took a giant leap into the future when Apple introduced the Macintosh. We've created Macworld as your passport into this incredible new realm of computing. Each issue we'll bring you everything you need to explore and get the most out of your Macintosh. From the latest product news to innovative business applications, from amazing graphics to personal productivity tools and games, each issue of Macworld will be packed with interesting, practical, readable information written by skilled, perceptive writers.

Each month we'll be creating a Macworld community, sharing ideas, problems, and creative solutions while we explore the world of Macintosh together.

So why take a chance on missing a single exciting issue? For a limited time only you can subscribe to Macworld at special Charter Subscriber rates of only

▲ \$24 for 1 year (12 issues)

That's a savings of 20% off the regular \$30 subscription rate and 50% off the newsstand price!

And you can save even more by subscribing for 2 or 3 years at Special Charter Rates. Don't Wait... Subscribe Today and Save! Call Toll-Free 800-247-5476 (in Iowa 800-532-1272)

Macworld
Subscription Department
P.O. Box 30380
Berkeley, CA 94703

ENCLOSED Please send me Macworld, the Macintosh magazine.

☐ Please Bill Me ☐ Payment Enclosed

☐ Please Charge my ☐ MasterCard ☐ Visa

Card # _____ Exp. Date _____

Signature _____

Number of (new only) _____

Please Send Me: ☐ 12 issues \$24 ☐ 24 issues \$48 ☐ 36 issues \$64

Name _____

Address _____

City, State, Zip _____

Subscriptions begin with the next available issue. Please allow 6-8 weeks for delivery of your first issue. Outside the U.S. subscriptions must be prepaid in U.S. funds. Outside the U.S. and Canada add \$12 per year additional postage for surface mail and \$60 per year for airmail. Allow an additional 4 weeks for delivery by foreign surface mail. This offer expires July 31, 1984.

COMPUTER INDUSTRY

Printronic announces end to patent suit

IRVINE, Calif. — Printronix, Inc. has announced the conclusion of its patent litigation suit against C. Itoh Electronics, Inc., its affiliates and Citicorp Watch Co. after receipt last month of an undisclosed sum of money.

The litigation, which sought to invalidate certain Printronix patents or in the alternative absolve Citicorp from charges by Printronix that the C3500 and C3600 dot matrix line printers infringed its patents, was initiated in November 1982 by Citicorp. Printronix filed counterclaims that alleged willful infringement of Printronix' patents.

The case was contested in both the U.S. District Court in Los Angeles and the International Trade Commission in Washington, D.C. In late January, several days after the trial had commenced, the parties reached a settlement during negotiations with the trade commission.

AEA fellowship set for Japan

PALO ALTO, Calif. — The American Electronics Association (AEA) has announced a graduate fellowship program under which as many as 10 U.S. electrical engineering and computer technology students will work for three to six months at electronics companies in Japan.

The pilot program is part of an effort by the AEA and the Electronics Industries Association of Japan to form closer ties between U.S. and Japanese high-technology firms.

Fellowship applicants must be full-time graduate students in electrical engineering or computer science at a major U.S. university. The application deadline is April 27. Information is available from the American Electronics Association, 2670 Hanover St., Palo Alto, Calif. 94304.



EXECUTIVE CORNER

■ Robert E. Mahoney has been promoted to president of Diebold, Inc. He succeeds the late Earl F. Weinstler, who had been on medical leave of absence since December 1983.

■ The following promotions have been announced by Prime Computer, Inc.: Richard Snyder, vice-president, software development; Leonard F. Hattie, vice-president, video products.

■ Alex Anderson has been appointed vice-president of international operations at Ultimate Business Systems, a subsidiary of Storage Technology Corp.

■ Steve E. Owen has been elected chief executive officer and member of the board of directors at Western Data Systems, Inc.

DEC grants gifts to Penn., Stanford

PHILADELPHIA — Digital Equipment Corp. recently announced gifts totaling \$18.5 million to the University of Pennsylvania here and to Stanford University in Palo Alto, Calif.

The \$12.5 million gift to Penn consists of a matching funds grant of \$10 million and a gift of 600 DEC Rainbow personal computers, valued at \$2.5 million. The \$10 million grant will be used by the school to buy up to \$20 million worth of DEC VAX-11 series superminicomputers and 1,000 DEC Rainbow and Professional 350 microcomputers. The VAX-11 series computers will be linked to the Rainbow models in what will become a universitywide computing network

called Pennet, according to a DEC spokesman.

The \$6 million Stanford gift, meanwhile, will fund Project Sundec, a joint venture between the firm and the school to explore the applications of distributed computing technology to provide university users with access to computing communications and file system resources. The Sundec research, according to the DEC spokesman, will examine the potential of local-area networks, distributed server-based resources and microcomputers.

Included in the DEC donation for Project Sundec are five VAX-11/780 computer systems, 105 Professional

350 personal computers and upgrade equipment for existing DEC equipment at the school. The new equipment will be linked to the university's Puro Systems Ethernet network and will also include DEC's recently introduced HSC50 mass storage servers, with RAS1 disk drives, as the initial server base of the distributed environment, according to the DEC spokesman.

Earlier, DEC also announced a plan to sell at discount to the university a mix of DEC Rainbow 100, Rainbow 100 Plus, Decmate II and Professional 350 computers. Those computers, in turn, will be sold at discount to the school's students.



COMPUTER INDUSTRY



SUPERSTOCKS

Softsch Microsystems, Inc. announced an agreement with Prunella, Inc. to distribute the company's UCSD Pascal and Fortran-77 products into the educational market. The agreement is part of the "IBM PC Apprentice" program.

The Braegon Corp. has started a software program to help support users of its 8400 and 8600 series by evaluating popular application software packages.

Unity Corp. announced a new contract with Tandy Corp. to supply its

Unity data base management system for the Radio Shack TRS-80 Model 100 microcomputer.

The International Information Processing Center announced the appointment of the following to its board of directors: Robert Capone, vice-president and director of Data Processing and Systems for J.C. Penney Co., Inc. and chairman of the board for J.C. Penney Systems Services of N.Y.; George W. Beiler Jr. Ph.D., head of the Section of Information Processing and Systems for the Mayo Clinic in Rochester, Minn.; and Olofin I. Garzner, president and cofounder of the Garzner Group.

Geographic Corp. announced the formation of a new equipment

group and the reorganization of business planning and RAD operations into a new business development group. Edward F. Manner will head the equipment group, and David R. Lundquist, senior vice-president, will head the business development group.

Plecoy Peripheral Systems, Inc. has restructured its divisional management organization and is combining its computer systems, computer products and distributor products division.

Specry Corp. announced a new facility for the design and manufacture of military computer systems to be built in Pueblo, Colo. The plant will deal with business growth resulting from contracts secured from the U.S.

Department of Defense for electronic information handling systems and products.

Stearns Computer Systems has signed an agreement with Professional Data Management Systems, Inc. (PDMS) to distribute PDMS' five professional management software packages.

Alta, Inc. and Aragon International Ltd. announced an agreement to market an integrated videotext electronic publishing system jointly on a worldwide basis. The offering will include Alta's Videotext production system and Aragon's IVS-3 videotext host data base system.

Televideo Systems, Inc. and Microstream, Inc. have signed a contract under which Microstream will offer Televideo IBM-compatible computers through its dealers. Microstream will market three Televideo systems: Tele-PC Model TS-1605, Tele-XT Model TS-1605H and TPC II.

Fifth Generation Technologies, Inc. announced that Western Union Corp. will service its new IBM-compatible microcomputer systems at 427 service centers throughout the U.S.

Milton Bradley Co. has announced the formation of MB Systems, Inc. The wholly owned subsidiary will develop and distribute computer software, with emphasis on general business applications, and offer consulting and contracting in the management information systems area.

Micro D, Inc. will distribute the Applied Computer Technologies' Apricot microcomputer as its first national computer account. The distribution agreement represents a full-scale entry into the American marketplace for the portable, MS-DOS-based personal computer.

POLICY

from page 123

trade associations and government officials in their countries.

Supporting national and international trade and business associations that are working on telecommunications and information issues.

Encouraging the U.S. executive branch and Congress to establish policies and laws and coordinate designated government agency activities to advance U.S. business interests abroad.

FLOW

from page 123

on in-country processing of domestic data.

Pipe said the U.S. government will continue to have difficulty combating these trends, for a number of reasons. He observed that the U.S. has sought to control or limit international data exchanges in some cases for national security reasons. Foreign governments see in the U.S. position a double standard, he said, and thus feel little compulsion to accept U.S. proposals for free flow of information.

The international situation is not getting any better, he added, saying that "less than half of the countries that will have [data flow] laws have [so far] adopted them."

Now IBM brings you a Sort of a different sort.

It's faster.

It's called DFSORT. It's a new release and it turns in a truly remarkable performance—thanks to an advanced "blockset" algorithm and effective use of advanced technology in IBM direct-access storage devices.

In tests using realistic samples of frequently sorted data, DFSORT dramatically reduced CPU time and the number of EXCPs.

The gains were significant under almost all test conditions, regardless of the character of the work or the system configuration. And IBM benefits from this performance daily in its own operations.

But speed is only part of the story.

Powerful DFSORT functions let the application programmer specify several commonly needed actions without writing exit programs. For example, the programmer can define criteria for including or omitting records to be sorted or merged, which improves performance since only relevant records are processed.

Similarly, the programmer can include or omit data elements within records, before or after sorting. In some applications this can significantly im-

prove the time and cost of the sort.

And there's a new summing function that provides the totals of designated fields.

DFSORT works in the OS environment. It is compatible with IBM's Extended Architecture (XA), and XA systems can invoke it from above the 16-megabyte line.

For facts on the faster sort, call your local IBM representative. Or call IBM toll free at 1 800 IBM-2468, Ext. 90; ask for the Software and Education Department. Or return the coupon.



IBM DRM, Dept. CH390 400 Parson's Pond Drive Franklin Lakes, NJ 07417		WFOVBY	4-30
I'd like to know more about a Sort of a different sort. Please send me details.			
Name _____			
Title _____			
Company _____			
Address _____			
City _____ State _____ Zip _____			

IBM software for the DP Professional.

COMPUTER INDUSTRY

ADP, IBM ink pact

ROSELAND, N.J. — Automatic Data Processing, Inc. (ADP) recently announced it has signed agreements with IBM to become a value-added dealer and reseller of IBM Personal Computers and Series/1 minicomputer systems.

The IBM equipment will be part of a new market data service that delivers stock quotes, news reports and other desktop and windowing services to account executives, according to ADP President Josh S. Weston.

The contracts follow an August 1983 agreement between IBM and ADP in which IBM has been providing support for ADP's development efforts.

ITC Item page 114

The ITC adopted a commonsense approach, as it had done in considering the question of contributory copyright infringement. Apple's expert, Rutina, had testified that about 18% of the Debono program was identical to Autostart — that is, 367 bytes were identical. About another 7% of Autostart had been incorporated into Debono at locations other than those in the original. Rutina had then retranslated the Debono program into assembly language and had discovered that 23 subroutines it contained were identical to Autostart subroutines, some of these located even at the same memory addresses and having the same title. The ITC concluded that the Debono program was sufficiently similar to Autostart

to infringe on Apple's copyright in the latter.

The great irony here is that the creator of the Debono program, having gone to so much trouble, might as well have created his own program. The whole point of knocking off someone else's work is to enjoy their financial success without the research and development costs.

Finally, the ITC confirmed that to make out a prima facie case of copyright infringement, it is only necessary to show "access and substantial similarity."

In other words, if it can be shown that the alleged infringer had the opportunity to study the copyrighted program and that he then came out with a program of his own which was substantially similar, the infringement case has been proven.

MAI Item page 111

selling efforts, according to Paul R. Lawovick, vice-president of Investor Relations. Joseph S. Tavares was released as head of worldwide marketing, but will now report to Keane instead of directly to Kurshan.

Edelman said he had not been made aware of the reorganization, but noted that Keane is "a competent operational manager."

At the April 18 board meeting, Edelman did not oppose Kurshan's reelection as chairman.

MAI spent \$3 million to defeat the Edelman slate in the proxy battle earlier this year, and it was stung with an additional proxy charge to income of \$6.1 million to cover the unanticipated cost of restricted stock grants released automatically as a result of the election loss.

At least one MAI stockholder greeted Edelman's accession to the board with enthusiasm. "I've been praying something like this would happen. Edelman has a terrific reputation," said Henry Brandy, a 15-year holder in the company.

SMUGGLE Item page 111

Pa., also pleaded guilty to two counts each of smuggling and face sentencing on April 27. Three companies in which Keh and Chua reportedly were owners and officers and that were alleged to have smuggled copies of Apple II computers pleaded guilty to charges of smuggling and conspiracy and face fines of up to \$75,000.

Those companies are Taiwan Machinery Trade Center (U.S.), Inc., Machine World, Inc. and Taiwan Toy and Gift Trade Center (U.S.), Inc., all of Philadelphia.

Assistant U. S. Attorney Edward Zitlau said he believes it is the first time that criminal convictions have been handed down on charges relating to copyright protections and smuggling counterfeit computers and the first prison term ever handed down for violation of copyright.

The charge to which Isadore pleaded guilty, according to Zitlau, is a misdemeanor. Isadore had also been indicted on smuggling charges.

All the charges settled during the recent hearing were contained in one of two federal indictments issued earlier this year [CW, Feb. 20]. Isadore and two other individuals, along with two other companies, face trial probably in May on the second indictment alleging a separate conspiracy to smuggle fake Apple computers into the U.S., according to Zitlau.

The government alleged that Chua and Keh smuggled the computers and components into the U.S. in mislabeled shipping containers. Isadore and Ryan, according to the indictment, negotiated with persons later identified as undercover U.S. customs agents for the sale of 250 Apple II's and Ryan later obtained 60 fake Apples from Chua and Keh and turned them over to the customs agents.

The case was seen as a breakthrough by a copyright counsel for Apple Computer, Attorney Gregory Stecher of the Beverly Hills, Calif. firm of Blakely, Sokoloff, Taylor and Zafman, said the use of criminal sanctions against copyright violators will serve as a strong deterrent to other importers of counterfeitware and that the imposition of a prison term was an "exceptional" action.

FALCON

on-line data entry that's above and beyond the ordinary

For an easy-to-use, completely interactive data entry system that's designed especially for the end user, you need FALCON.

FALCON operates standalone or as a task under CICS and the other major TP monitors giving you total flexibility and performance. It supports both DOS and OS operating systems to provide versatility and upgrading capabilities. And FALCON automatically converts VIDEO/370 formats.

FALCON's high-level security system protects your data against unauthorized access. It lets you decide which operators can use specific functions. And with FALCON you never worry about losing data. If the system fails, all data is recovered. If a terminal breaks down, just go to another terminal, retrace your data, and start working — right where you left off.

FALCON's on-line instructions help you design screen formats, enter and verify data, maintain files, create tables, and submit your own jobs. Just touch a key, tell FALCON what you want to do, and the instructions appear right on the screen.

With FALCON, you can make decisions based on the productivity of your operators without leaving your office.

You can monitor the progress of all active terminals and view job accounting statistics on-line.

FALCON's built-in edits include table lookup, range testing, defaults, balancing, and much more. FALCON goes far beyond other data entry systems to let you use your terminal as an operator's console and view the activity and contents of the input and output queues.

So make sure you're getting the most from your resources. Choose FALCON. Call for a free trial. You'll be glad you made the right choice.

For more information contact:
Phoenix Computer Corporation,
11949 Jefferson Boulevard,
Calver City,
California 90230.
Toll free (800) 225-5049 or
(213) 827-4500 in California.



FALCON

If you're not in *Computerworld's* next five special reports, look at the issues you'll be missing.



MAY 20

Software Productivity Packages
We'll tell our readers all about the software and services available to benefit DP managers and their technicians.

Closes May 11.



JUNE 20

Graphics Systems
If you have something to offer the graphics user, this is the place to be. We'll focus on the latest technologies, techniques, and applications.

Closes June 8.



JULY 2

NCC Preview issue
A detailed roundup of the vendors and products to see at the show (complete with booth numbers). Plus we'll take a look at the special attractions in Las Vegas.

Closes June 15.



JULY 9

NCC Show issue
We'll highlight Data Pro's yearly hardware survey. Readers always enjoy studying other user's candid ratings of systems and vendors.

Closes June 22.



JULY 16

NCC Wrap-up issue
Part 2 of Data Pro's hardware survey. Also, we'll let readers in on the major product announcements and happenings at the show.

Closes June 29.

For more information, or to reserve your space in any of our upcoming issues, call the sales office nearest you. Or fill out and return the coupon below to: Ed Marecki, National Sales Director, *Computerworld*, 375 Cochituate Road, Box 880, Framingham MA 01701. Do it today.

☐ Software Productivity Packages
☐ Graphics Systems
☐ NCC Show issue
☐ NCC Preview issue
☐ NCC Wrap-up issue
☐ Please have a sales representative call me.

Name _____
 Title _____
 Company _____
 Address _____
 City _____ State _____ Zip _____
 Telephone _____

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Sales Offices

BOSTON: 275 Cochituate Road, Box 880, Framingham MA 01701, (617) 879-0700; CHICAGO: 3800 South River Road, Suite 304, Des Plaines IL 60018, (312) 987-6430; NEW YORK: Paramus Place I, 140 Route 17 North, Paramus NY 07652, (212) 763-1306; ATLANTA: 1800 Foster Road, Suite D, Atlanta GA 30328, (404) 394-8758; SAN FRANCISCO: 300 Broadway, Suite 30, San Francisco CA 94133, (415) 421-7230; LOS ANGELES: 1800 Sky Park Circle, Suite 360, Irvine CA 92714, (714) 263-1230.

COMPUTER INDUSTRY

GOAL from page 111

there are fairly few companies with competing products," said James A. Rutherford, executive vice-president and chief operating officer. "We compete mainly for a share of the DP budget."

Growth at Goal has been anything but quiet. In a field in which O'Donnell said development costs typically can be recovered in a year or less, the company grew more than 80% in revenues last year. Goal's heady expansion plans call for \$60 million in revenues by 1986. The company has no long-term debt and finances all its research and development from profit.

The turning point for Goal Systems may well have been its seemingly prophetic decision to expand into CBT in 1978. CBT has since become

one of the most glamorous growth areas of the software industry. "We're going to push CBT as fast as we can push it," Rutherford said.

After three years of only marginal success as a CBT vendor, Goal is beginning to reap the bounty of its decision. Phoenix is a restructured version of coursework that had been in use at Ohio State University here for several years. Goal obtained the product for a song, agreeing only to support it at Ohio State and to provide some consulting services in exchange for full marketing rights. The company then put nearly three years of work into Phoenix, rewriting its user interface and adding technical enhancements.

Not surprisingly, the move into a new market caused an upheaval at Goal. "CBT was [O'Donnell's] idea

and frankly, I didn't think we would make a market out of it," Rutherford said. "We had only eight people on staff at the time. I thought we had taken too big a bite."

But O'Donnell saw Phoenix differently. "CBT seemed like a natural extension at the time to distribute instructions about our applications," he said. "It was already in use at Ohio State and seemed very stable. We also had the services of Ed Frank [the product's author at Ohio State] for the modification."

Not only did Goal have to build a sales force devoted to CBT, but it found itself up against the juggernaut of IBM's Interactive Instructional System (IIS). "I first thought Phoenix would sell on the basis of efficiency, but found that wasn't enough of an incentive to replace

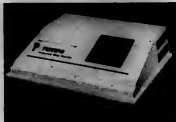
IIS," O'Donnell recalled. "A major turning point was deciding not to emphasize performance. We found that most users didn't have that many people using CBT anyway. The resistance was to the need to learn a language."

Goal revamped its market focus to stress Phoenix's object-oriented authoring system, which it claims eliminates the need to learn a language. The strategy has apparently succeeded. Phoenix today claims more than 750 users, and its sales last year were probably the major factor in Goal's skyrocketing revenue.

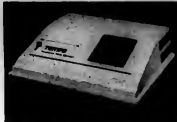
Last year, Goal also inked a marketing agreement with Datalink, Inc., a major vendor of CBT coursework, to provide Phoenix as a bundled front-end to all Datalink software, thus eliminating the need for IIS. If a customer later decides to write some of his own courses, he can pay Phoenix the \$38,000 license fee and obtain the password that opens the authoring system.

Phoenix has also provided an in for what could be a major new marketing turn for Goal Systems into the area of artificial intelligence. The company is taking what Rutherford called "a very serious look" at expert systems — software that uses a knowledge base to make informed decisions.

Avant-Garde announces Tempo II "P" Response Time Monitor



Tempo II



Tempo II "P"

They look the same, but they're poles apart

With the Tempo II response time monitor, the NCC can call on terminal operators to update load Tempo's statistics to the host computer for manipulating and further analysis.

But what if the operator's out to lunch?

TEMPO

The new Tempo II "P" has solved the "no-pol" problem. Now, the NCC can poll Tempo at any time. Even if the terminal is unattended. Even at night. Even at pre-determined hours. From the host, or from a specially-designated PC.

Because both Tempo II and Tempo II "P" give you true end-user response time, they are ideally suited for service level agreements.

Tempo—the truly responsive response time monitor.

Mail to:

Avant-Garde Computing, Inc.
8000 Commerce Parkway
Mt. Laurel, New Jersey
08054-2227

I want to know more about Tempo II "P".

Name _____
Title _____
Company _____
Address _____
City _____ State _____ Zip _____
Telephone _____

Tempo is a trademark of OTS Incorporated.

Goal awards its developers with royalties

Writers get a royalty for each book they sell, and movie actors make money on each ticket that's bought. So why shouldn't the same standards apply to software developers?

Goal Systems International, Inc. believes they should. As a result, the company pays its developers a royalty on each copy of a software package that is sold. The commission can range as high as 12% of the sale price and maintenance fees, according to James A. Rutherford, executive vice-president and chief operating officer.

Rutherford said the bonuses are in addition to the "competitive salary" Goal offers. Developers do not receive raises while they are working on a project, but when the software is released, members of the project team split a percentage of the revenues. Some Goal software developers make over \$100,000 a year, he said. Consequently, Rutherford said, employee turnover at Goal "is very rare."

Goal argues that the arrangement not only promotes high quality development, but also creates typically tense relations between technical and marketing personnel. In fact, users who call in questions or complaints can often speak directly to the product's author. "It's a terrific deal," said Thomas R. Welch, a product manager who recently joined Goal as a developer. "I know that if I write five enhancements to a product, it can sell five more copies. I've got an interest in keeping that product out on the market."

IF YOU MISS CW ON COMMUNICATIONS, LOOK AT THE ISSUES YOU'LL BE MISSING.



JUNE.

Bypass. Bypassing the local loops provided by the Bell Operating Companies has become rampant with the availability of alternative technologies. See what this means to both big, regional operating conglomerates and smaller, non-Bell Operating Companies—all in the June issue. Closes May 4.

On Communications is ideal both for the advertiser and the reader. Because each one offers focused, in-depth information on areas of interest within communications.

Readers always want to catch up on what's hot and what's not in their particular



JULY.

AT&T update.

Who are the winners and who are the losers after more than six months of deregulation? Closes June 1.

specialty. And find out what the vendors have to offer.

As an advertiser, you won't want to miss the opportunity to tell them.

Maybe that's why our On Communications is becoming more popular every day.

Because everyone wins.



AUGUST.

This issue will look at various teleconferencing technologies—including full motion video, freeze frame, electronic blackboards and computer conferencing. The cost-effectiveness of teleconferencing technology will be examined, plus information on private and public facilities—all in the August issue. Closes June 29.

For more information, or to reserve your space in any of our upcoming issues, simply call the sales office nearest you. Or fill out and return the coupon to Ed Marecki, National Sales Director, Computerworld, 375 Cochituate Road, Box 880, Framingham, MA 01701.

To: Ed Marecki, National Sales Director
CW Communications/Inc., Box 880, Framingham, MA 01701

Please send me advertising information on: ☐ AT&T update.

☐ Bypass. ☐ Teleconferencing.

☐ Please have a sales representative call me.

Name _____

Title _____

Company _____

Address _____

City _____

State _____

Zip _____

Telephone _____

CC

Computerworld
On Communications

Sales offices:

BOSTON: 375 Cochituate Road, Box 880, Framingham, MA 01701 (617) 879-6700; CHICAGO: 2000 South River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433; NEW YORK: Farman Plaza 1, 140 Route 17 North, Paramus, NY 10765 (212) 957-5530; ATLANTA: 1852 Peachtree Road, Suite D, Atlanta, GA 30339 (404) 334-0758; SAN FRANCISCO: 300 Broadway, Suite 40, San Francisco, CA 94133 (415) 422-7330; LOS ANGELES: 18000 Sky Park Circle, Suite 240, Irvine, CA 92714 (714) 261-4230.



GET THE FACTS FROM THE LEADER MATHEMATICA PRODUCTS GROUP

MATHEMATICA Products Group (MPG) is a leader in the Computer Software Industry and a part of Martin Marietta, a major Fortune 500 company. We develop technologically superior products like **RAMP® II** and **ATLAS™** for the IBM environment and are currently engaged in a major expansion of our Software Engineering Department.

SYSTEMS SOFTWARE DEVELOPMENT ENGINEERS/PROGRAMMERS

Opportunities exist that challenge the imagination with the team that created **RAMP® II**, the leading fourth-generation language in technology and sales. A sample of our current development projects include:

ATLAS™—We are the only company currently developing a general purpose data communications monitor designed specifically for today's IBM operating systems.

Intelligence—We are developing a knowledge-based Artificial Intelligence product for natural language processing.

DBM—We are developing a practical implementation of advanced data base management theory.

TITANIUM—We are developing an on-line program development system with full screen editor, library system, and operating system interface.

USER INTERFACE—We are continuing to extend and enhance how users interact with our 4GL system thru full screen devices, high resolution graphics terminals, micro computers, etc.

RAMP® II for desk top—We are developing a system to provide the full power and capability of mainframe **RAMP® II** on desk top and personal computers.

In addition to these and other ongoing projects, there are always new projects starting. Your ideas and efforts could someday result in a marketable software product.

SYSTEMS SOFTWARE SUPPORT ENGINEERS/PROGRAMMERS

Exciting and interesting areas are available working with our existing software products. For example:

PRODUCTION ENGINEERING—Provides you the opportunity to learn and work with all the major IBM operating environments and supported products while performing problem investigation and resolution and interactive debugging of developed software.

QUALITY ASSURANCE—Develop test plans for new products and components. Participate in systems and unit testing of all developed software.

CUSTOMER SUPPORT/TROUBLESHOOTING—Deal with people who are using our products to help them understand how best to approach and solve their problems. Help diagnose and correct problems in our software. These are non-traveling positions.

REQUIREMENTS—If you have a degree or equivalent experience, plus expertise in one or more of the following, we would be interested in talking to you.

- ★ **IBM Assembler language programming skills**
- ★ **IBM Mainframe operating systems internal experience:**
DOS/VSE • VM/CMS • MVS/TSO • VSE/POWER • JES
- ★ **IBM Access Methods**
VSAM • BTAM • TCAM • VTAM
- ★ **UNIX Operating Systems**
"C" Programming skills
- ★ **Experience in development or support of:**
 - teleprocessing/data communications monitors
 - data base management systems
 - micro computer software
 - 4GL systems
 - knowledge-based AI software
- ★ **Previous customer support experience in the IBM mainframe environment.**

ENVIRONMENT—Work in an environment that brings state-of-the-art system software products to the market. Enjoy private windowed offices with full screen terminals on your desk providing access to our in-house CPU's. We are a major node in the Martin Marietta Data Systems computer network which provides access to about 70 MIPS of computer power. Also available are numerous personal computers.

LOCATION—These exciting and interesting career opportunities are at MPG's headquarters in Princeton, New Jersey. Enjoy a suburban environment and still be only an hour away from two of the major cities in the Northeast. Princeton is centrally located between New York City and Philadelphia, and our offices are conveniently located near the Amtrak train line. In addition, the Princeton area is one of the most attractive areas on the east coast with model school districts and ample housing.

BENEFITS—You can earn competitive New York metropolitan area salaries plus share in a comprehensive benefits program which includes tuition assistance, flexible hours, three weeks vacation, technical incentive, Company paid profit sharing, relocation assistance, medical, life insurance and retirement plans.

THE TIME IS RIGHT TO TAKE ADVANTAGE of the available opportunities. Please send your resume and salary history (in strict confidence) to: **Justine Bedden, Manager of Employment,**

MATHEMATICA PRODUCTS GROUP, P.O. Box 2382, Princeton, New Jersey 08540.

MATHEMATICA Products Group
A Martin Marietta Data Systems Company

an equal opportunity employer



POSITION ANNOUNCEMENTS

PROGRAMMER/ANALYSTS

Weber State College has two openings for qualified Programmers/Analysts to assist in the development of institutional requirements for fully integrated administrative and basic applications systems.

The successful candidates will work with users and project team in the analysis, design, and development of new applications systems and enhancement and maintenance of existing systems. The individuals may supervise students and personnel and perform other duties as assigned.

Required qualifications: Bachelor's degree in Computer Science or related field plus at least three years of full time work experience in a programming environment. Must be able to write and maintain computer code. Experience in establishing and maintaining effective working relationships with clients and users. Previous ability to organize and perform work tasks to meet specified deadlines and requirements. Experience in data base development with exposure to relational design methodologies and fourth generation applications development systems are preferred. Information in development of information or financial information systems is required. Solid experience in the COBOL, Pascal, and Fortran.

Weber State College is located in Ogden, Utah in the heart of the North Eastern Utah fair seasonal recreational area. We offer salaries commensurate with experience and an excellent fringe benefits package. Including three months of vacation the first year of employment. Good letter of application, detailed resume and three letters of references to:

WEBER STATE COLLEGE

Mr. Jay Hensley
Assistant Director
of Computing Services
Ogden, Utah 84403
An affirmative action/equal opportunity employer

PROJECT MANAGER

MSI Inc. of Lansing, MI, seeks experienced project manager to oversee IBM/OS/VS IMS DB/DC COBOL, data management system. You'll take the reins of responsibility for directing staff. Salary \$44,000.

SYS-38 P/A N.H.

Expanding unit in rural location needs tech. professional who will direct & plan, install, troubleshoot & train tech. staff. Excellent tech. challenge awaits. Know the area? Salary to \$20,000.



TECHNICAL SUPPORT
MSI Systems, Inc.
1000 Summer Street
Beverly, MA 01912
(617) 433-1300
Personal Connections

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

People who go to work for most big computer companies may never be heard from again.

While software professionals may disappear at some big computer companies, we can promise you'll never become invisible here.

At Nixdorf Computer Software Company you have the chance to make a major contribution, because we're not overgrown with layers and layers of people or approvals.

But you will have the advantages of being part of a billion-dollar computer company. You'll be challenged by Nixdorf's commitment to develop leading-edge systems software for customers

around the world.

You'll be supported by extensive research and development. And you'll have one of the best salary and benefits packages in the industry.

So if you'd like to join us, call or send your resume to: Jackie Moore, Manager, Human Resources. (No agencies please.)
Nixdorf Computer Software Company, 6517 Everglades Drive, Richmond, VA 23225, 1-800-446-9900. In VA, 804-276-9200.

SYSTEMS PROGRAMMERS

Responsible for designing, coding and implementing software products and enhancements. Duties include Hardware Analysis, Software Engineering, Product Analysis, consulting and training. The ideal candidate should have 3-5 years of systems programming experience in the DOS or UNIX operating systems environment, extensive knowledge of Assembler or "C" programming language, and software development experience. Degree in Computer Science preferred.

Nixdorf Computer Software Company



An equal opportunity employer M/F/H

CUSTOMER SUPPORT REPRESENTATIVES

Responsible for providing software support to customers worldwide. Duties will include extensive customer contact to determine problems, on-site installation, user-training, development of installation tools and aids. The ideal candidate should have at least 5 years of education and experience with INCSO software and/or equivalent IBM products, knowledge of Assembler language, and the ability to interface with customers.

TECHNICAL WRITERS

Responsible for writing, testing, editing, proofing, and supervising final production for internal and user documentation. The ideal candidate must have extensive technical knowledge of systems programming, knowledge of Assembler language and at least 5 years of experience as a software technical writer. Degree in Computer Science preferred.

The world's smallest billion dollar computer company.

NETWORK ADMINISTRATOR

UCSD - La Jolla, California

We are looking for someone to plan, design and install a campus wide, local area network providing two entities for data and voice communications. The successful candidate will have the responsibility for planning and installing a network that will connect various, but separate, data and voice systems. The position requires a person with a strong record of success in the network design and implementation of a campus wide network. The successful candidate will have a minimum of 5 years of experience in network design and implementation. Salary range \$41,100 - \$64,100 annually plus excellent benefits. Applications should be submitted to box 2, UCSD.

UCSD
University of California,
San Diego

Staff Personnel Office
901 Warner Canyon (1400-4) 9-016
La Jolla, CA 92093

EO/AA Employer

EXPERIENCED SYSTEMS PROGRAMMERS, ANALYSTS AND PROGRAMMERS ANALYSTS FOR SUPPORT LOCATIONS

Job description, compensation and location are the primary factors in determining the best person for the job. We are looking for experienced systems programmers, analysts and programmers analysts for support locations. We offer excellent opportunities for growth and advancement. Let us help you succeed in your career. We are looking for experienced systems programmers, analysts and programmers analysts for support locations. We offer excellent opportunities for growth and advancement. Let us help you succeed in your career.

Dunhill
OF CHARLOTTE, INC.
401 Central Road, Suite 100
Charlotte, North Carolina 28226
(813) 436-3000
(N.C. Call)
(704) 342-5072

POSITION ANNOUNCEMENTS

Data Processing

MIS Professionals

Join NEC in California's fast-paced, exciting Silicon Valley

A technologically advanced working environment complemented by the modern and beautiful surroundings of the Santa Clara Valley, help make NEC the company of the future! We are the third largest semiconductor manufacturer in the world, and offer uniquely challenging and stable career opportunities. Join our family of high achievers and help us create a new MIS environment for our 4381. Due to expansion we have the following new openings:

Senior Systems Programmers

(2 positions available)

- *MVS/ICS Internals
- *IMS/DB DBA

Senior Systems Analyst

(1 position available)

- *Sales Order Processing
- *Inventory Control Applications

Senior Programmer Analysts

(3 positions available)

- *Financial Applications
- *Business Applications

We are creating an on-line, real-time order processing/inventory control/reorder/receivable system using CICS/VS/DB on a 4381 under MVS. As an experienced MIS professional, wouldn't you like to be a part of this exciting project?

Successful candidates will have five years' experience in the appropriate area, a four year degree or equivalent and good communication skills. Interest in networking personal computers and experience in the electronics industry would be pluses.

NEC offers competitive salaries and a full range of company paid benefits including relocation assistance. If you would like to join the NEC University, please send your resume with salary history to:

Human Resources Dept. C/P-0430
NEC Electronics, Inc.
401 8th St.
Mountain View, CA 94043
Call collect
(408) 745-6820

An equal opportunity employer M/F

NEC
NEC Electronics, Inc.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

Computer Applications Specialist I

The computer systems Department at the Atlanta Health Sciences Center, seeks a qualified Information Systems Programmer/Analyst to be responsible for the development and design/maintenance of a medical records and billing system.

The minimum qualifications are a Bachelor's degree in Computer Science or a related field and 1 year of experience in programming experienced in 2 years of programming experience. Systems programming experience. Systems programming experience. Systems programming experience. Systems programming experience.

To apply, please call or send your resume to: Staff Development Office, University of Arizona, 1717 E. Speedway, Tucson, AZ 85724 (602) 887-3000.

UNIVERSITY OF ARIZONA

BOHANNAN ACTION EMPLOYER

DALLAS, TEXAS

COMPUTER SECURITY PROFESSIONALS

For your professional security expertise, we are seeking individuals to join our Security Department. The position involves the design, development, and implementation of security systems for the University of Texas at Dallas. The successful candidate will be responsible for the design, development, and implementation of security systems for the University of Texas at Dallas.

- Design and development of security systems
- Implementation of security systems
- Testing and evaluation of security systems
- Training and documentation of security systems
- Maintenance and support of security systems
- Research and development of security systems

Send resume of this opportunity to: Director of Security, University of Texas at Dallas, 7500 North Park Drive, Arlington, Texas 76010. Salary negotiable to a competitive level.



TOTAL SECURITY PROTECTION, INC.
2000 West Park Drive
Arlington, Texas 76010

Bryant Bureau

HAS THE COMPUTER PROGRAM FOR YOU

If you are not accomplishing your career goals, call us and we'll help you. Our computer program is designed to help you achieve your career goals. It's a computer program that will help you achieve your career goals.

NATIONWIDE OPPORTUNITIES

- Tech Support: \$10,000 - \$15,000
- Field Sales: \$15,000 - \$20,000
- Product Development: \$20,000 - \$25,000
- Marketing: \$25,000 - \$30,000
- Training: \$30,000 - \$35,000
- Management: \$35,000 - \$40,000
- Executive: \$40,000 - \$45,000
- Senior Manager: \$45,000 - \$50,000
- VP: \$50,000 - \$55,000
- President: \$55,000 - \$60,000

To become part of the growth in the 80's, call us today and we'll help you. Our computer program is designed to help you achieve your career goals.

Bryant Bureau
1000 S. Tenthon, Suite 1000
Arlington, VA 22201
(703) 527-0000

THE RESUME SYNDROME

18 of 30 Resumes and go in tomorrow's unemployment. If you want your resume to be the 1 in 30 that gets the call, call us today. We'll help you write a resume that will get you the call. We'll help you write a resume that will get you the call.

To receive a FREE COPY, attach a copy of this ad to your resume and mail it to us in U.S.A. only.

1. Write your name and address.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

CICS SPECIALISTS

Salary Open

New York, Washington, D.C., Houston

A major systems consulting firm has immediate openings for CICS specialists to work on significant projects involving banking and financial institutions, oil and gas firms, and government agencies. These projects span the full life-cycle from systems concept through installation and use CICS together with various data base management systems.

Due to the rapid growth in all business areas, these positions may lead to excellent technical consulting and/or team leadership opportunities for professionals with 3-5 years of experience.

Your compensation will be matched to your capabilities in a firm with salaries in the top 25% based on the Hansen-Walsh surveys. Excellent fringe benefit package.

For confidential inquiries, please send resume to:

Gregory J. Walling
Walling & June
716 Church Street, Suite 200
Alexandria, VA 22314
(703) 548-5669
Equal Opportunity Employer



In a bind?

Do you need real professionals? Advertise in Computerworld to find exactly who you're looking for. Because...More computer people read Computerworld than any other newspaper in the United States—more than half a million computer people every week. And, among our 529,650 readers at user organizations, about half claim to look at recruitment ads at least every other week (only a small percentage say they never look at recruitment ads). No wonder Computerworld carries more recruitment ads for computer people than any other publication.

To place your ad or to get a rate
Call or write:

Classified Advertising
Computerworld
Box 990
Frammingham, MA 01701
(617) 879-0700
(800) 343-6474

INFORMATION SYSTEMS OFFICER

GM-334-15 • \$50,252 - \$66,327

U.S. NAVY *Commander,
Military Security Command • WASHINGTON, D.C.

The Command Information Systems Officer will develop plans and procedures and manage efforts to provide integrated ADP support worldwide throughout the Command. Supervises the Command Information Systems Office which supports critical MSC deployment and treatment missions, including Strategic Mobility Planning, Crisis Management, and Fleet Operations, as well as major branch, supply and personnel operations. Provides expert technical guidance within and outside MSC and develops computer policies and procedures with many organizations including the Secretary of the Navy, Joint Chiefs of Staff, WPMCCS, various federal agencies and the maritime industry. The person selected for this job must have superior qualifications in computer system and information resource management. Experience in the successful development and implementation of major systems is mandatory. A background in DOD operations, the deployment community, and the maritime industry is highly desirable.

Mail by May 4, 1984, Standard Form 171 and statements detailing your knowledge, skills and abilities in the following areas: ADP Operations; State-of-the-art management and office system technology; Management and Supervision; Planning, Organizing and Implementing Programs; Oral and Written Communication; and Equal Employment Opportunity Support.

U.S. Navy, Building 1, Room 32
400 Wisconsin Avenue
Bethesda, MD 20814

CCPO-NW
400 Wisconsin Avenue
Bethesda, MD 20814

EEO/AAE/DFW/OFSP

U.S. GOVERNMENT PRINTING OFFICE

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

SOFTWARE SPECIALISTS

The solution is in the mountains

Digital is innovation's best friend.

It is the ability to entertain the unique, to think in separate ways, to step around standard concepts to better conclusions—to make friends with change—that has earned us the reputation as the genius of the computer business.

We've brought innovation to the mountains.

We have set up a solution system in the shadow of Pikes Peak in Colorado Springs.

It is a very different approach to customer support.

It's centralized—a gathering of the best software and service engineering minds in one place to answer all questions.

Why? Because we don't think intellectual isolation is the best way to solve problems. We found it helps to be able to consult with the professional on this—the specialist on that—when the "tough ones" come up. It helps to put minds together.

This established remote service center provides technical support to clients throughout the U.S. and Canada. They call in for quick answers.

The center is staffed with high-tech talent—talent equipped with virtually unlimited computer resources. And a substantial library.

It's all the resources under one roof.

We are looking for professionals in the following areas to join us near our special "mountain."

SYSTEM SUPPORT

Requires 3 or more years
VAX/VMS experience, plus

demonstrated strong system programming experience using MACRO, BASIC and DCL.

VMS

Requires 2 or more years of system experience. Applications in high level languages preferred. VMS experience a definite plus.

VAX INFORMATION ARCHITECTURE

Requires 18 months experience in software services or applications design and programming, data base design, implementation and maintenance and/or forms management utilization. In-depth knowledge of VAX Information Architecture products such as DTK32, DBMS, and FMS is preferred.

DECnet

Requires 2 or more years experience working with DECnet applications, VAX, RSX, or RSTS systems and a solid knowledge of communications protocols.

TOPS-20/TOPS-10

Requires 2 or more years of operating system support experience with DEC SYSTEM-30s, DECsystem-10s or other large timesharing systems exposure. Applications experience in several high level languages is preferred.

UNIX*

Requires 2 or more years experience using UNIX

operating system and "C", preferably Berkeley UNIX, and its associated tools.

*UNIX is a trademark of AT&T Bell Laboratories.

PRE-SALES/TECH SUPPORT

Requires 2 or more years system experience on one or more Digital operating systems and a basic knowledge of Digital hardware configurations.

We know to attract the best minds we not only have to offer a stimulating intellectual environment—but a living environment that is special and unique. Colorado Springs is close to all the deep powder a skier could want, clear streams, wilderness trails, wide open spaces, long views—and reasonable housing costs. Yes, beauty can sometimes cost less.

Our relocation package will make your move cost-forever.

If you are looking for an intellectual environment, creative energy—and a view—contact Susan Corbale, Digital Equipment Corporation, Dept. 0430 3804, 4405 N. Chestnut Street, Colorado Springs, Colorado 80907. Please indicate positions of interest.

We are an affirmative action employer.

People and Technology.
PERFECT INTERACTION

digital

SYSTEMS ANALYSTS

Middle South Services has one of the South's largest data processing centers serving one of the nation's largest power systems. Middle South Utilities, our parent company, is a major electric utility. Our hardware environment includes IBM 3084, 3081, 4341 and Tandon 486-186.

Working with user personnel, you will determine users' requirements and propose solutions to information related problems. Requires 3+ years of large IBM hardware experience in forms design, user training, system testing and on-site development. Data base design experience along with RDB knowledge is also needed for the position. Large accounting system development is a plus.

Due to our size and scope of operation, we offer access for advancement, career stability and an excellent salary with major benefits. For more information, call our number below or to apply directly, send your confidential resume to: Byron Hault or Richard Jackson, MIDDLE SOUTH SERVICES, INC., P.O. BOX 91000, NEW ORLEANS, LA 70161.

1-800-231-4481

In Louisiana, call collect (504) 885-0900



MIDDLE SOUTH SERVICES INC.
Equal Opportunity Employer M/F

IMMEDIATE OPPORTUNITIES SENIOR D.P. PROFESSIONALS

Cutter-Williams Inc., a major diversified Data Processing company, is seeking the following individuals for a major financial development project in Dallas. These are permanent staff opportunities.

SYSTEMS ANALYST

• Life Cycle Methodology experience
• Exposure in large development applications

• DATA BASE

• TELEPROCESSING

SENIOR P/A

• IMS DB/DC

• COBOL

• DB/MSYS

Excellent communication skills and professional appearance required.

Cutter-Williams offers an excellent compensation and benefit package in addition to a company-paid relocation. Call or send resume to:



Richard W. Bell
Corporate Recruiting Mgr.
Cutter-Williams Inc.
3000 W. Loop
Suite 500
Dallas, Texas 75244
(800) 327-4427
(214) 355-2471

SOFTWARE ENGINEERS
UNIX*, C, PDP11, M88000

Many interviews are being held in Minneapolis, Chicago and St. Louis

Computer Consoles, Inc. designs, develops, manufactures, markets, and services a variety of minicomputer-based fault-tolerant information systems. Headquartered in Rochester, New York, we have all the cultural and educational advantages of a large metropolitan area as well as the ambience and scenic beauty of a small, relaxed town.

CCI currently has immediate opportunities for:

Group Leaders/Software Engineers

You'll be responsible for the design and implementation of data base applications and utilities, or fault-tolerant operating system development including development of a multiprocessor UNIX-compatible transaction processing system.

We prefer a technical degree plus a minimum of 2 years' experience. Knowledge of C, UNIX, and data structures plus experience with data bases in a minicomputer Real Time or on-line environment and/or OS internals are also desired. We are willing to train otherwise qualified candidates with high level languages. U.S. citizenship or permanent residence is preferred.

*UNIX is a trademark of Bell Laboratories.

We offer opportunities for growth plus attractive compensation and benefits including relocation. For immediate confidential consideration, please forward your resume including salary history and the location of interest to you to, or call:



J. C. Hostette
Computer Consoles, Inc.
87 Humboldt Street
Rochester, New York 14608
(716) 482-8200 x2816
Equal Opportunity Employer M/F

FOR ACHIEVERS ONLY

INTERMEDIATE to SENIOR LEVELS

- Software Development Mgr.
- Technical Support Specialist
- Data Base Administration
- Voice/Data Communications
- Office Automation
- Microprocessor Software
- Systems & Programming Mgr.
- EDP Audit/Security
- Systems Planning
- Manufacturing Systems

BEC, HONEYWELL, IBM, MCR, UNIVAC

BRUCE A. MONTVILL
Managing Partner

EXTENDED 2100

National Recruiting Consultants
(909) 892-6715

COMPUTER PARK, P.O. BOX 4979
HARTFORD, CT 06182

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS



We are an industry leader and a \$2+ billion division of PepsiCo, Inc. and we are positioned for the most extensive data processing support in our history of success. Frito-Lay Management Services Division is a leader in state-of-the-art technology and offers career-oriented professional growth opportunities for Systems Engineers and other data processing professionals in our Dallas-based headquarters.

Network

You will work with applications development and technical services on large scale processing projects. 3-5 years Data Processing experience, including Information Systems background utilizing ACFT, VTAM, SOLC, IMS, and DBA are required. The last 2 years of your total experience should be in a Systems Programming Group. We prefer a degree.

DISSO - Office Automation

You will be responsible for consulting with applications development and technical services on special projects. 3-8 years Data Processing experience, including Information Systems background utilizing ACFT, VTAM, SOLC, IMS, and DBA are required. The last 2 years of your total experience should be in a Systems Programming Group. We prefer a degree.

MVS

You will consult with DBA, applications development and operational groups on technical problems, and will plan and evaluate hardware and software systems and packages. To qualify, you must possess 2+ years Data Processing experience with at least 1 year in a Technical Support Group, proficiency in ALC and IBM setting programs, JES 2, technical knowledge of MVS internals and a college degree. Data problem solving and fluent communication skills are also required.

We also have positions for: DATA COMMUNICATIONS SPECIALISTS, APPLICATIONS PROGRAMMING, EXPERIENCED DBA, DISC using COBOL, and PRODUCTION and OPERATIONS SUPPORT PROFESSIONALS.

Frito-Lay regularly expanding IBM multiprocessor environment is recognized as one of the most progressive installations in Dallas/Ft. Worth, and includes 2000+ users and 1100 programs running on a DBA network of over 1000 terminals and 200 Personal Computers. Frito-Lay anticipates plans including upgrading our IBM 3081 to the new IBM 3084 processor, converting the migration from 2300 to 2380 data units and moving to MVS/2.3L, as well as implementing an Office Automation subsystem on CICS/VS1.

If advancing your career means upgrading to exceptional opportunity for career development, superior facilities, a desirable salary/benefit and outstanding salary, then we have the opportunity for progressive environment with unlimited opportunities at Frito-Lay. For immediate consideration, please forward your resume, including salary history, to:



Frito-Lay, Inc.

Professional Personnel
P.O. Box 4678
Dallas, Texas 75246

Equal Opportunity Employer, M/F/H/V

DATA COMMUNICATIONS PLANNING AND SUPPORT SPECIALIST

The Hill Farms Regional Computing Center located in Madison Wisconsin has an immediate opening for a data communication specialist to assume a leadership role in planning and implementing a statewide Information System Network. The Center is part of the Wisconsin Department of Transportation and provides information services to seven state agencies. In addition to supporting large on-line applications such as Driver Licensing, the Center is rapidly implementing new facilities such as office automation, electronic mail and image processing on the network. The selected individual will play a key role in planning and implementing the communication software/hardware to support these services.

The Regional Center operates a network using an IBM 3081 and an Amstar 9550 running MVS. 5-IBM 8100 DDP workstations and 100+ IBM 3270 type terminals. The network operates within DBA using ACFT, VTAM, ACFT, CAM, ACFT, NCP, CICS and MVS DC as the network software. The qualified individual would have at least three years of systems programming experience in the above software with increasing management responsibility. Starting salary of up to \$21,421 per year with increase after six months. For application materials and information call:

Victor Thompson
(608) 266-2615 or write
Dept. of Transportation
P.O. Box 7515 - Personnel
Madison WI 53707

Application deadline May 18, 1984 - Wisconsin Residency is not required

An Equal Opportunity Employer
Furnishing Under An Affirmative Action Plan

SYSTEMS PROGRAMMER

PROGRAMMER ANALYSTS

LEE MEMORIAL HOSPITAL, a 550-bed hospital on Florida's Sunny South Coast, is currently seeking experienced Systems Programmer and Programmer Analysts. Must have 3+ years experience using IBM PC/XT and/or IBM PS/2 and/or IBM PC/XT. Also, 2+ years experience in COBOL, ALGOL, BASIC, C, and/or PL/I. Please send resume to: Mr. J. L. DOWNS, PERSONNEL, OFFICE, 1000 N. W. 10th Ave., Ft. Lauderdale, FL 33304.

LEE MEMORIAL HOSPITAL offers a competitive salary and complete benefits package and our team. Please contact:

Staff Salary Director
Data Processing
LEE MEMORIAL HOSPITAL
P.O. Drawer 2218
Ft. Myers, FL 33902
(813) 334-6226

Equal Opportunity Employer

SR. MARKETING EXECUTIVE

This is a unique opportunity for senior professionals to join a national start-up company in the IBM mid-range market which is now in a highly competitive position. This is a high growth area with a high potential for rapid expansion. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market.

Familiarity with microcomputer systems and understanding of the various distribution channels are essential. Sales experience in the IBM mid-range market is a plus. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market.

The Marketing Data Processing Service Center is seeking qualified individuals for the position of Sr. Marketing Executive. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market.

Requirements: Bachelor's degree in Marketing, Sales, or Business Administration. 5+ years experience in sales and marketing, with a focus on the IBM mid-range market. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market. The position will require a strong background in sales and marketing, with a focus on the IBM mid-range market.

Send resume to: Mr. J. L. DOWNS, PERSONNEL, OFFICE, 1000 N. W. 10th Ave., Ft. Lauderdale, FL 33304. Please include salary history and references. Equal Opportunity Employer.

David Brown
Marketing Data Processing Service Center
1000 N. W. 10th Ave.
Ft. Lauderdale, FL 33304
Send resume by May 18, 1984.

DATA PROCESSING MORTGAGE BANKING COMMERCIAL BANKING SAVINGS AND LOAN

Midland Financial Co. is seeking a team of highly qualified data processing professionals to meet the demands and challenges of a dynamic growth oriented organization.

We are looking for people with Project Management, Systems Development and Computer Operations experience. If you are a Business Analyst, System Analyst, or Programmer/Analyst experienced in building, testing or supporting financial systems on line, we are providing opportunity for you.

For the successful candidate we offer a competitive compensation and a challenging professional environment. If you are interested in this opportunity, and your resume with salary history to:

Vice President, Data Processing
Midland Financial Co.
P.O. Box 39949
Columbus, OH, 43238

UNIX + C LANGUAGE \$35,000 - \$50,000

Advanced Programming Resources, Inc., a dynamic growth oriented Contract Services organization specializing in Consulting Systems Design and Programming Development, has an immediate need for talented Systems Engineers. Must have a degree in Computer Science or Electrical Engineering, 3 or more years programming experience using C Language, PASCAL, or PL/I, UNIX Operating Systems, strong knowledge of Relational Databases and multi-user systems helpful. Knowledge of VAX or other mini computers required.

APR provides above average benefits and compensation. If you feel you want to join the team, please send your resume in confidence to:



ADVANCED PROGRAMMING RESOURCES, INC.
6900 North High Street • Worthington, Ohio 43082 • 614/885-2888

"An Equal Opportunity Employer"

COMPUTERWORLD

The Recruitment Connection...

... the best connection to have when you are looking for quality computer professionals. There is a good reason why COMPUTERWORLD is the number ONE computer industry trade newspaper. No other newspaper of its kind can give you the broad exposure that you will get by advertising in COMPUTERWORLD. It is read by over half a million people, most of them top-notch professionals with top-notch computer companies.

COMPUTERWORLD publishes every Monday and the deadline for receiving your advertisement is always ten days prior to the issue date desired. The open line rate is \$9.15 per line with a minimum size of 2 column inches. Send in either camera-ready material or clearly typed copy with a layout if desired. We also have a telecopier service and adtakers who will gladly take copy over the phone.

Our mailing address is COMPUTERWORLD, Classified Advertising, 375 Cochituate Road, Box 880, Framingham, MA 01701. Or call for more information at 1-800-343-6474 or, in Massachusetts, (617) 879-0700.

COMPUTERWORLD

The best connection to have.
The only connection you'll need.

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

Tandem Systems Professionals

San Francisco

If you have experience with Tandem Systems, you may qualify for development work at The Crocker Bank on an important and visible International Computer Systems project. We're innovators in international banking systems, enhancing the strengths of our Tandem hardware with such state-of-the-art technology as PCIS and TSP and a small team environment for our select group of professionals.

Systems Engineers

In-depth systems engineering background, proven troubleshooting and performance tuning skills, and an understanding of basic data communications are required. Experience with networks and Tandem products preferred, plus the ability to effectively interface with users and vendors. EFT a plus. Highly qualified candidates with a non-Tandem background will be considered.

Production Support Analysts

You must have supervisory experience in an operations shift area. Tandem operations preferred. Liaison, troubleshooting, and scheduling are a plus.

Programmer Analysts

Assignments at various levels are available, requiring maintenance and development experience in on-line transaction processing environments. Excellent communication skills and COBOL proficiency are required. DAL is a plus.

Reward your experience with the recognition you'll earn at The Crocker Bank, along with a competitive compensation and benefits package. For immediate consideration, please forward your resume to:

B.Y. Alcalá
Professional Employment
The Crocker Bank
Dept. CW
79 New Montgomery Street
1st Floor
San Francisco, CA 94105

Principals Only
Equal Opportunity
Employer



The Crocker Bank

TeTech

We're Looking For The BEST CICS Instructors In NYC...

...and Chicago, Los Angeles, San Francisco, Orlando, Washington D.C., Dallas, St. Louis, Atlanta, Minneapolis...

Now's your opportunity to join TeTech, a leading CICS organization. We supply the students, support and high salary—You supply the expertise and ability to share it in a relaxed, interactive atmosphere.

If you are fluent in several of the following areas:

- Programming and Debugging: CICS Command Level and Macro
- Internals: Recovery/Restart, Architecture, Tuning, Debugging
- Databases: IDMS, DL/I, ADABAS
- Files: VSAM
- Telecommunications: VTAM

TeTech wants to hear from you today! Contact Mr. Boylan at (212) 514-5448.

TeTech

Our Reputation is On Line

31 Broadway • New York, NY 10006 • 212-554-5448

FIELD SERVICE ENGINEERS

Satisfaction with a mountain view

As a talented Field Service Professional, you know what you want out of life.

First you're looking for the right kind of work—projects that are challenging—assignments that introduce you to diversity. You want to leave the routine, the usual, the mundane behind you and move into an exciting technical environment that has energy.

You want to keep your mind alive—no just keep your hands busy.

And you want a chance to work with the best people in your field—to consult with the best support minds around—because learning has a lot to do with association.

And you want access to the most sophisticated troubleshooting tools and techniques—because your talent has earned a chance to work with the future.

Digital offers you the best chance to achieve your great technical expectations. And more.

We carry satisfaction a step further. We not only have set up 'the ideal' in technical environments—we considered the living environment too.

Our established and rapidly expanding remote service operation is located in the foothills of the Rockies in the shadow of magnificent Pikes Peak.

We have assembled the best software support and field service minds and set them up in a state-of-the-art facility with the purpose of centralizing the customer support function.

As part of our Remote Support Staff, you would utilize complex test equipment, operating software, customer site historical data, diagnostic manipulation, configuration rules and other resources to identify and resolve system or device problems.

You will consult with other engineers and customers throughout the U.S. and Canada—and without travel. That means you can say goodbye to long days in a van.

You must have 3+ years computer service experience, a knowledge of system operation and how to modify or improve diagnostics and strong customer relations skills. Advanced knowledge and work proficiency on PDP 11/70 & 11/44 or VAX 11/780 & 11/750 families of devices is preferred.

The work is important.

The living is easy.

Isn't that what 'satisfaction' is all about? If so, contact Diane Kerley, Digital Equipment Corporation, Dept. 0430 3804, 4405 N. Chestnut Street, Colorado Springs, Colorado 80907.

We are an affirmative action employer.

People and Technology
PERFECT INTERACTION

digital



PROGRAMMERS, ANALYSTS AND CONSULTANTS

Established Southern California consulting firm is seeking several qualified individuals to add to its staff. Our firm shares the responsibility for implementing several large systems throughout California. WE NEED: 2 years experience in any of the following: Banking, Item Processing, Savings, Loans, Distribution, Insurance, COBOL, ASSEMBLER, CICS, IMS DB/DC and IBM Software. WE OFFER: stability, growth, high salaries, mobility, advancement opportunity, and excellent fringe benefits. Call or write:

Quintessential Personnel
PO Box 500
3400 West 6th Street, 200
Los Angeles, California 90005
(213) 388-3891

MORE IBM SYSTEMS PROGRAMMERS CICS, IMS, DB/DC, VM

The more we find, the more we need. Our company clients are still clamoring for qualified Systems Programmers. In order by the number of openings, locations are PL, NC, TX, SC, TN, GA, CA, VA, AZ. Selected positions available in most parts of the U.S. Special needs for:

CICS Systems Programmers
MVS Systems Programmers
Data Base Administrators
Performance Tuning Specialists

202-388-234-40X
234-40X
234-40X
234-40X

We guarantee: 1) NEVER A CHARGE TO YOU—our company clients pay everything—base, interview costs, relocation, etc. 2) STRICT CONFIDENTIALITY & PROFESSIONAL REPRESENTATION by JIM KING AND ASSOCIATES, a nationally ranked recruiter in the computer industry.

Please send your resume or call collect (804) 268-0242 for:

Steve Stevenson, Partner
(804) 268-7371



Jim King and Associates

1649 Gulf Life Tower, Jacksonville, Florida 32207
(904) 368-7371

PORTION ANNOUNCEMENTS

PORTION ANNOUNCEMENTS

PORTION ANNOUNCEMENTS

PORTION ANNOUNCEMENTS

PORTION ANNOUNCEMENTS

The Missing Piece(s)?

A career isn't easy to put together. Often it's a matter of making do with inadequate pieces. But you're worth more than that.

At CONSULTANT SYSTEMS we're taken excellent compensation and fringe benefits and add:

- Professional Environment
- Variety of Assignments
- Variety on Important Projects
- Environment of Exciting Staff
- Advancement Based on Performance

We are seeking:

- Programmer/Analysts
- Senior Programmer Analysts
- Technical Writers

Openings in many areas of the Continental U.S. State in one of the following areas: IBM AS/400, MVS, MVS, CICS, DB2, ACP, IBM DB/2 or IBM S/34, M, M, S/390.

Call COLLECT or submit resume to: Robert B. Peltz, Corporate Project Staffing, CONSULTANT SYSTEMS, INC., P.O. Box 14108, Pittsburgh, PA 15233. Collect (412) 735-0200.

Equal Opportunity Employer M/F/H.
Discrimination on basis of race.



CONSULTANT
SYSTEMS, INC.

THE MINISCRIBE DIFFERENCE... SUCCESS FOR YOUR CAREER

If you're climbing to the top of your career, make sure there's something worthwhile when you get there. Look up to a leader at MiniScribe. Currently we are seeking you:

MIS DIRECTOR

The ideal candidate will have 10+ years experience, with at least 5 years in a management capacity. The MIS Director will have responsibility for managing a major development effort including integration of automated factory data collection system, as well as multiple site installations and international voice data communications. Our current system includes dual HP 3000 interactive system utilizing FORTRAN and COBOL. Extensive manufacturing systems experience is required and previous experience with Just-In-Time manufacturing systems is desirable.

We offer top-level visibility in this ground floor opportunity as well as an excellent compensation program, including an equity package.

Come up to the challenge of MiniScribe... it's nice at the top. Submit resume and salary history in confidence to:

Mr. Jerry Patton
Human Resources Dept., Bldg. 2
1861 Lehigh Drive
Longmont, CO 80501

MiniScribe

An Equal Opportunity Employer

HONEYWELL DP86, LEVEL 6 MicroSystem 6/10

We are a firm which specializes in supporting the Honeywell user. If you have work experience with any of the following:

Package	OS	Plus
DEF II	MOD400	Customer Support
LOAS I	MOD600	System Design
DMS TP		Application Design
TP80		

Honeywell maintenance experience also considered.

We would like to talk with you! Please call and forward resume to:

L.R. WECHLER LTD.
16370 Democracy Lane
Fairfax, Virginia 22030
(703) 255-0400

UNIQUE OPPORTUNITY FOR ONE VISIONARY SOFTWARE-SYSTEMS PROJECT SPECIALIST

Our definition of Computer Aided Engineering (CAE) is:

- Computer Aided Design (CAD & CDD)
- Computer Aided Analysis (CAE & CED)
- Technical Management (Cost-Budget-Scheduling)
- Data Base Management

Your UNIQUE opportunity is:

Create the heart and soul of our CAE activity
Do you have "The Right Stuff" to meet this challenge?
The Right Stuff includes:

- Hands-on experience with DDD System Life Cycle Development issues, problems, requirements
- Working knowledge of DDD & MIL-STD's, including DDDO 5000.1, DDD's 7935.1, DDD-GTD-480A, MIL-STD's - 483, 480, 1521, 1679.
- Strong Quantitative Methods education and experience (e.g. system effectiveness/cost analysis, OR modeling, LE trade studies).
- Strong people skills
- Strong communication verbal AND written skills
- Masters level education

If our opportunity challenges your right stuff, contact:

Phil Harbison

2301 West 158th Street, Hawthorne, CA 90240

ELECTRONICS DIVISION

NORTHROP

Making Advanced Technology Work

U.S. CITIZENSHIP REQUIRED • Equal Opportunity Employer M/F/H

COMPUTER SYSTEMS TECHNOLOGY

Tenure track, full time position in the Computer Systems Technology Dept. Bachelor degree in Electrical or Computer Engineering plus three years professional experience required. Knowledge of microprocessors, Assembly language, Pascal & Fortran highly desirable.

Salary & rank commensurate with experience & educational background. Send letter of application with complete resume before May 31, 1984 to:

Mrs. Janet Bales
Norwalk State Technical
College
181 Richards Ave.
Norwalk, Connecticut
06854

An affirmative action, equal opportunity employer. Qualified women & minority candidates are encouraged to apply.

RESUMES

All Writing Needs

- Effective, professional
- For today's job seeker
- Free cover letter package
- Fast, reliable, confidential
- Creative & editorial services

FORD/YOUNG

ENTERPRISES

P.O. Box 137
New York, N.Y. 10011
(212) 530-6618



Manager Technical Services

\$37,680 - \$45,540
Annually

The Office of the Chancellor for The California State University has a career opportunity in our Division of Information Systems located in the mid-Wilshire area of Los Angeles. The primary function is the overall responsibility for implementation, maintenance, and modification of all data communications, operating systems and operating systems related software for the two different operating systems running on 40 different computers distributed across at 18 campuses and the State University Data Center.

Minimum qualifications include five years of progressively responsible experience performing analytical studies of DP procedures including at least three years in the generation, maintenance, design, and development of data communications, operating systems and operating systems related software. Two years of this experience must have included responsibility for supervising a data processing unit charged with operating system support responsibilities. Requires the equivalent to graduation from a four year college university. Resumes must be received in Personnel Services by May 11, 1984. Please send to: Personnel Services, Box A258-2, Office of the Chancellor, The California State University, 400 South Shore, Suite 112, Long Beach, CA 90802-8275.

Equal Opportunity
Affirmative Action Employer



POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

POSITION ANNOUNCEMENTS

UNUSUAL OPPORTUNITY FOR SCIENTIFIC PROGRAMMERS AT BRISTOL-MYERS

OPPORTUNITY

Three opportunities in Bristol-Myers Research, located at Mead Johnson, offer unique challenges to support statisticians as well as basic and clinical research scientists. You'll develop and maintain programs which generate statistical analyses, tables, and/or graphs using SAS or other statistical computing languages. For a Senior level opening, you can qualify if you have a B.S. degree in science with at least a minor in computer science plus three years scientific programming experience. For an Assistant level opening, you can qualify if you have the degree and an interest in scientific programming.

INNOVATION

Bristol-Myers, a world-wide leader in research and development, has a strong heritage of accomplishments and a strong future. Our uninterrupted growth is the direct result of our innovation. Our operating style encourages personal creativity and contribution and we're thoroughly professional.

LOCATION

This unit of Bristol-Myers is located at Mead Johnson in Evansville, Indiana, a community of beautiful residential areas, outstanding recreational opportunities, exceptional education and cultural facilities, and more. Best of all, Evansville couples the advantages of southern economy with the changing beauty of four-season living.

To investigate these reasons for joining Bristol-Myers Research is to discover a wealth of others. Excellent salaries, superb benefits, including paid relocation, and real growth, both personal and professional. Discover us! When it comes to your career, no one can offer more!

Send resume in confidence to Employment Dept. BLSB, Bristol-Myers Research Department, Mead Johnson & Company, Evansville, IN 47721.
An Equal Opportunity Employer M/F/H/V



GROW WITH US

Amicon, a division of W.F. Grace & Co., and a world leader in computer science has an opening for a Programmer/Analyst.

Programmer/ Analyst

The individual selected for this position, located in Denver, must have at least 3 years' experience programming in FORTRAN on the System 34. Knowledge of computer programming languages COBOL, all Systems 34 utilities and MVS/ICS software is required. M.S. or D software experience is a plus. This is an excellent opportunity to develop and implement the five general accounting and manufacturing systems for our Scientific Systems Division.

Please respond in writing, stating salary requirements to Kathy Dulles, at the address below.

amicon AMICON CORPORATION

17 CHERRY HILL DRIVE
DUNFRIES, PA 19028

We are proud to be
an affirmative action employer m/f

BADDOUR INC. INFORMATION SYSTEMS

Position: Information Systems Programmer/Analyst with our 200 solid units in the southeast is available. An Information Systems Programmer/Analyst for projects.

WORKING LARGE SYSTEMS: PROGRAMMER ANALYSTS SYSTEMS PROGRAMMER

Position: Available with excellent benefits for heavy work and salary range in many areas of Florida, Kentucky, and other states in a southern area. Major work.

- Computerized Compensation
- Excellent Working Conditions
- Excellent Benefit/Compensation Plan
- Medical and Life Insurance
- Disability Protection
- Professional Management
- Corporate Teamwork Approach
- Structural Design and Development
- Detailed Audio Visual Training
- Heavy DMS II
- TFS/Transaction Processing System
- Computer MVS/Message Control System
- Data Dictionary
- State of the Art Integrated Retail Mgmt. Systems
- Good Turnover/Profitability
- History of Japanese Hardware and Software Growth
- COBOL/C++ Programmer
- IBM/AS/400
- Removable Hard Disk
- Warm of the South

Please forward resume or letter of application, including salary history to:

Personnel Director
Baddour Inc.
4885 New Richmond Road
Memphis, TN 38119

HEWLETT-PACKARD OPENING ALL FIVE FIVE IN, NC, MA, MI

If you have HEWLETT-PACKARD experience, and an opening in your area, send me your resume and salary history to: TODAY, I am representing 5 clients with opportunities ranging from programmer analyst to systems analyst with salaries at \$35,000. Call me for more details. COLLECT. CALL: SHARON AMON, C.P.A., P.O. BOX 100, WILKINSON, NC 27708, (704) 854-5811.

Banking/Savings + Loan INFORMATION SYSTEMS

The Leading Edge
In Executive Search

FLORIDA CONNECTION

ALL EMPLOYMENT
OPPORTUNITIES

Open House Hours: 10:00 AM - 5:00 PM	To: INFO
System Prog. Mgr., Sys. OCS	To: INFO
Pro. Tech. Support	To: INFO
ACTIVITY/Anal. Prog.	To: INFO
Pro. Tech. Support	To: INFO
Security, Mgr. OCS	To: INFO
SA, Project, Admin. Mgr.	To: INFO
SA, Project, Admin. Mgr.	To: INFO
SA, Project, Admin. Mgr.	To: INFO
SA, Project, Admin. Mgr.	To: INFO
SA, Project, Admin. Mgr.	To: INFO

TANDEM Expertise?

Call or send resume to:
Mr. Neil J. Oursatky
Director, Information Services

ENTRE

1951 Kilduff Drive, Suite 400
Vienna, VA 22180
(703) 556-0800

COMPUTERWORLD CLASSIFIEDS WORK!

- POSITION ANNOUNCEMENTS
- BUY SELL SWAP
- SOFTWARE
- SOFTWARE WANTED
- TIME & SERVICES
- REAL ESTATE
- BUSINESS OPPORTUNITIES
- SEMINARS/CONFERENCES
- BIDS AND PROPOSALS

It's easy to advertise in COMPUTERWORLD. If you don't have an advertising agency to supply us with copy, layout and order, or camera ready mechanical, stat or film negative of your ad, just call one of our ad-takers at 1-800-343-6474. They will be glad to take your ad and typeset it in available fonts at no extra charge. If you have lengthy ads that require logos and artwork, just send a clean typewritten copy of your ad to the classified advertising department at COMPUTERWORLD (teletype service is available); note the ad size you want; and, if you want your company logo to appear in your ad, please be sure to include a camera-ready copy with your insertion order. You should also supply any special borders, headlines and artwork that you want in your ad. Our Art Department will follow your suggested layout as closely as possible if you wish to send one.

Ad closing is every Friday,
6 working days prior to issue date.

Rates: Open rate is \$128.10 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs \$256.20 per insertion. Additional space is available in half inch increments. Some sample sizes and costs are shown.

- 1 col X 4" - \$ 512.40
- 2 cols X 4" - \$1024.80
- 2 cols X 5" - \$1281.00
- 2 cols X 6" - \$2049.60

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available, \$15 per insertion.

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

Boston - (617) 879-0700
or (800) 343-6474

New York - (201) 967-1398

Chicago - (312) 827-4433

San Francisco - (415) 421-7330

Los Angeles - (714) 556-6480

Atlanta - (404) 394-0758

TELETYPE SERVICE - (617) 879-0700 or (800) 343-6474 ext. 451 or 410

Cynthia J. Delany, Classified Operations Manager

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP



STEP UP TO VAX 11/780

It's never been easier to move up to a VAX. We have several attractively priced, high quality pre-owned systems available for immediate delivery.

- ☐ We will configure to suit your needs
- ☐ We offer flexible lease plans, too
- ☐ Call us to schedule a demonstration

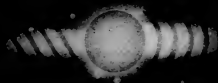
(415) 772-4696



U.S. Equipment Sales
DEC remarketers since 1975

COMDISCO

Commitment
to Excellence



BUY • SELL • LEASE

SERIES-1

**S/34 • S/36 • S/38
4300**

S/23 S/32 5110-20
Tape-Disk-Printers-Tubes

AMCOM

CALL TOLL FREE

800-328-7723

3375's
A1, B1, B1, D1
Disk/Lenox

PRINTERS - 4245 • 3202 • 3203 • 3211 • 1400 • 3204 • 3205 • 3207 • 3208

3375's
3375 3374
3303 3278
3278 3178
3278 3277

4341's
Lenox/Tapes 1-8 Tps.
4341's
Disk/Lenox

DASD
3390 3375
3370 3350
3344 3310

Control Units
3850 - B13
3850 - D13
Intel, July 84
Disk/Lenox

TAPE DRIVERS
3420 3430
3410 8808

We Buy, Sell & Lease IBM Processors and Peripheral Equipment



Computer Marketing Inc.

8710 VENTNOR AVENUE
MARGATE, NJ 08402-2223
609/823-6000 • 800/345-0005
Contact/Bernie Gost

CDR

***** **DEC** *****

**BUY-SELL-LEASE-TRADE-CONSIGN
SYSTEMS — PROCESSORS — OPTIONS
PERIPHERAL — MODULES — MEMORY
— SPARES —**

**NATIONAL COMPUTER EXCHANGE
(800) 624-9299**

600 North Lunar Avenue, Brea, CA 92621
TWX: 910-596-1499 (714) 990-5988

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

If we
can't get it,
it can't be got!

The Total Computer Company...

Apple IIe
IBM PC
IBM XT

IBM AT

IBM

Hartford Computer Group



800-323-6355

or 312-364-0505

DEC EQUIPMENT
AT THE
**LOWEST PRICES-
NATIONWIDE!!**

CALL
TOLL FREE **800-328-7000**
In Minnesota (612) 894-4080 • TELEX 291084

MIDWEST SYSTEMS, INC.
12117 Riverwood Drive, Burnsville, Minnesota 56327



Going To **3725.?**
SAVE UP TO \$50,000
WITH SNA COM CONFIGURATIONS.
CALL Dave McCormick
SNA.COM Associates

1001 Nevada Dr., Raleigh, N.C. 27604
A leasing company with a difference.

STC
TAPE/DISK
BUY • SELL • LEASE

3081-411-3677



1000

1200

1500



TELEX 750027
encore
(212) 462-9117

SERIES ONE Tape Drive

Datum D451 with dual
density controller.
Certified operational.
\$6,000
(less than 1/3 of an
IBM 4967-4C)

4955E

256K and timer.
Under maintenance.
\$3,500

Call Bill Crutchfield
at (804) 973-1811

SELLING?

Sell your product or
service in Computer-
world classifieds.
Join the thousands of
advertisers who use
our classifieds
because they get
results.

You can find buyers
for discs and DEC's,
terminals and
timesharing,
software and
System 370's.

More than half a
million active
computer people
read Computerworld
each week, and you
can reach them
efficiently in
Computerworld
classifieds.

To place your ad, or
to get a rate card with
complete details on
Computerworld
Classifieds, call or
write:

**Classified
Advertising**

**COMPUTER
WORLD**

P.O. Box 880
Framingham,
MA 01701

1-800-343-6474
617-879-0700

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

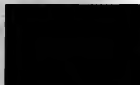
BUY SELL SWAP

BUY SELL SWAP

WANG • DEC

National authorized CDC OEM-Distributor (for Controllers and Media) offers New Equipment, fully warranted for 90 days:

			
\$12,900	\$7,750	\$8,875	\$20,825
CDC Model 5775 (80 MB.) WANG Model 2200-2, and 800 5775 MB./CDC Model RMO 5 (200.1 MB.)	CDC Model 5780 (80 MB.) WANG Model 2200-1 (75 Megabyte) CDC Model RMO 3 (57.1 MB.)	CDC Model 5785 (80 MB.) WANG Model 2200-3 (60.4 MB.) WANG Model 2200 V-A, 800 MB. CDC Model RMO 7 (85.4 MB.)	CDC Model 5775 (80 MB.) WANG Model 2200 V-3 (60 Megabyte) CDC Model 3-RMO 7 (85.2 MB.)



ERST

INTERNATIONAL CORPORATION

205 Lafayette Street, New York, NY 10012

ERST is the leading dealer in pre-owned WANG equipment - 2200, VS, HP (CPUs, Terminals, KPs, Controllers, Printers, Memory Upgrades).

Next time give us a call... Tel Free 1-800-FOR-ERST... In NY 212-431-1100

C.D. SMITH & ASSOCIATES, INC.
DEC computer systems & options
12001 East Freeway, Suite 318
Houston, Texas 77015
(713) 481-3112
TELEX 76-8547

DEC

WE ARE SELLING:
VAX 11/70, 11/70B, 11/70C
& MOST VAX OPTIONS

ALSO	
RAI-44, 517, 60	800-44, 517, 60
RAI-44, 517, 60	800-44, 517, 60
RAI-44, 517, 60	800-44, 517, 60
RAI-44, 517, 60	800-44, 517, 60
RAI-44, 517, 60	800-44, 517, 60
RAI-44, 517, 60	800-44, 517, 60
RAI-44, 517, 60	800-44, 517, 60
RAI-44, 517, 60	800-44, 517, 60
RAI-44, 517, 60	800-44, 517, 60

If you want our Selling List, call Valente (713) 481-3112.

ATTENTION TO DETAIL
All of Our IBM Equipment is
Tested/Audited/Refurbished

3101's

Immediate/New

Buy/Sell/Lease
X XERXES
COMPUTER
SALES

1011 Horizon Place
Newspaper, NY 11540
609-338-3864, 612-338-3843

SYSTEM Call Collect: 612-338-3864
34 S/31
S/36
ALL S/38
UPGRADES
IBM Parts
IBM Parts
IBM Parts

IBM PARTS
Same day or overnight
Call Collect
404-226-7480

SYSTEM/34

96K - 639MB
Single 2D Diskette
5211 Printer with
300 LPM Belt
(3) - 5251 Terminals
\$32,200
Contact Mrs. Membro
(617) 794-4538

FRONTIER Your Full Service Computer Dealer

DPD MAIN FRAMES PERIPHERALS COMMUNICATIONS — Call — FRED HANSEN	S/34 S/36 S/38 — Call — RICHARD LORANG	Series/1 • Systems Configured To Your Space • All Features and Peripherals Available • Depot Repair Service — Call — JOHN BURLEW RANDY STONE	3270's 3277 • 3278 3274 • 3276 3271 • 3272 — Call — TERRY SMITH
---	---	---	---

DALLAS: 214-380-7243 • HOUSTON: 713-550-7398
CORPUS CHRISTI: 512-642-6428
1811 Coliseum, Suite 100
Houston, Texas 77061

Buy - Sell - Lease

S/34
S/36
S/38

IBM

3741
3742

ONLY CITS, PRINTERS
ALL MODELS
PURCHASE LEASING
SHORT & LONG TERM LEASES

Computer Marketing of America, Inc.
P.O. Box 71
510 Bryan Street
Old Hickory, Tennessee 37138

1-800-251-2670
In Tennessee: 615-467-6071

DATA GENERAL

Hanson Data Systems

IBM

5110 5120
3741 3742
DATAMASTER

1255-MICA

SYSTEMS
34 36 38 32 72
All Models Available

BUY SELL LEASE

• Pre-owned • New • Refurbished
• Upgrade • Repair • Replace
• Trade-In • Lease • Purchase
• All Models Available

Call Today for Details
(615) 255-6595

SOLOTECH
DATA SYSTEMS
Newark, NJ

Classifieds

Your business problems need not be terminal.

COMPUTERWORLD, the nation's #1 computer trade newspaper has the #1 cure for your business needs - its Classified pages.

- All the remedies are there:
- finding computer professionals for you
 - finding you a job
 - buying/selling/leasing your computer equipment
 - securing bids and proposals
 - announcing seminars & conferences
 - advertising available real estate
 - advertising your computer time & services

At \$9.15 per line (\$128.10 per column inch), you can put an end to your troubles. The minimum size ad is 1 column x 2 lines (\$256.20). Send us either camera-ready material or clean, typewritten copy (enclose a layout if you wish) and any artwork, borders, or logos you want to use. We will put your ad together according to your specifications. Or you may call one of our ad-takers who will take your copy and advise you on the size and cost of your ad.

COMPUTERWORLD comes out every Monday and the classified advertising deadline is the Friday, 10 days before the publication date. If you are a first-time advertiser, please send us payment with your ad.

All materials should be sent to: COMPUTERWORLD, Classified Advertising, Box 980, Framingham, MA 01701.

Get on the road to recovery! Call us at 1-800-343-6474 (in Mass., 617-879-0700) to give your ad over the phone, reserve space, or request a rate card.

Classifieds

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

CMI

AMERICA'S LEADING
SPECIALIST SERVING
THE USED MARKET

Absecon, NJ (609) 545-7282

Aston, MA (617) 357-5795

Chicago, IL (312) 686-2786

Dallas, TX (214) 355-0585

San Jose, CA (415) 790-9113

Houston, TX (713) 780-7489

Lafayette, LA (504) 455-5553

Miami, FL (305) 454-3450

Newport Beach, CA (714) 780-9443

New York, NY (212) 545-4718

Tampa, FL (813) 877-0088

Parsippany, NJ (201) 419-1121

Riverside, CA (951) 511-1121

St. Paul, MN (612) 370-0555

Toronto, Ontario (416) 545-3005

(416) 545-5100

Vancouver, B.C. (604) 685-5155

Windsor, Ontario (519) 873-9818

CMI FINANCIAL SERVICES GROUP

3800 Telegraph Rd., P.O. Box 2088

Bloomfield Hills, MI 48304-2088

(313) 455-0000



A Torchmark Company

3800 Telegraph Rd., P.O. Box 2088

Bloomfield Hills, MI 48304-2088

TWX/TELEX: 919-235-1887 CMI CORP. 7788

(313) 455-0000

3081-D16

Sale or Lease

3081-K24

Sale or Lease

For Sale or Lease
4381

1st Quarter Delivery

3033

All Models

New Series 1

Basic Operating System
"Lite" 1 to the Series 1
800 Model 104
1000 Model 104

3388's

Available Now
On a Short Term Lease
5575 - 5575 2000

3080-A6

Available Now

4700

Working Equipment
Buy/Sell/Lease

3725

Lease Financing Available
For your Business or Own
2, 3, 4 or 5 Year Terms

3080

Model 1's Immediate Delivery
Model 2's Lease Financing
Available July Term
3080-4 3011-1 & 3011-1
3080-4 4080-1

3080

Immediate Delivery

3080-4020

Buy/Sell/Lease

Wanted

4341-M2

4341-L81

Call Now

3270, 3270

3271, 3270

Turnovers

All Models

Immediate Availability

3705-3704

Available for

Immediate Delivery

Sale or Lease

3080-40

Model 1's & 2's Available Now

New Series

3080-40

S, S, 4 or 5 Year Terms

813075

Availability Now - Sale or Lease

Series 1 100

Any Series Computer

Any Series Computer

Any Series Computer

Any Series Computer

Any Series Computer

Any Series Computer

You can get information
on buying or leasing
IBM 34-36-38
as fast as you can dial
1/800/LEAS-PAK.

In Texas call 817/265-0023.

Up to 50% Savings

LPI

Leased Term - 18 Months,
any dollar and percent as much.
We can let you avoid or
minimize ownership.

LEAS PAK INTERNATIONAL

P.O. Box 739 • Houston, TX 77053 • (817) 265-0023

Send for our free products and services brochure:

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____



IBM SYSTEM/34

S/3 • S/32 • S/38

5291 • 5251

3741 • 3742

BUY • SELL • LEASE
REFURBISHED • RECONSTRUCTED
SHORT-TERM LEASES
PURCHASE/LEASEBACK



218 BRACK PARK NORTH
P.O. BOX 248
ROSELLETTVILLE (MADISONVILLE)
TENNESSEE 37072

800-422-1004

IN TENNESSEE CALL (615) 884-3872

RENT • BUY • UPGRADE • SELL

POP, 1500, 1500A, 1502, 1504, 1505,
1506, 1507, 1507A, 1507B, 1507C, 1507D

SYSTEMS • OPTIONS • SUPPLIES

1500 IBM, Real 1500, 1501-A, Real 1501-B, 1501-C, 1501-D, 1501-E, 1501-F, 1501-G, 1501-H, 1501-I, 1501-J, 1501-K, 1501-L, 1501-M, 1501-N, 1501-O, 1501-P, 1501-Q, 1501-R, 1501-S, 1501-T, 1501-U, 1501-V, 1501-W, 1501-X, 1501-Y, 1501-Z, 1501-AA, 1501-AB, 1501-AC, 1501-AD, 1501-AE, 1501-AF, 1501-AG, 1501-AH, 1501-AI, 1501-AJ, 1501-AL, 1501-AM, 1501-AN, 1501-AO, 1501-AP, 1501-AQ, 1501-AR, 1501-AS, 1501-AT, 1501-AU, 1501-AV, 1501-AW, 1501-AX, 1501-AY, 1501-AZ, 1501-BA, 1501-BB, 1501-BC, 1501-BD, 1501-BE, 1501-BF, 1501-BG, 1501-BH, 1501-BI, 1501-BJ, 1501-BL, 1501-BM, 1501-BN, 1501-BO, 1501-BP, 1501-BQ, 1501-BR, 1501-BS, 1501-BT, 1501-BU, 1501-BV, 1501-BW, 1501-BX, 1501-BY, 1501-BZ, 1501-CA, 1501-CC, 1501-CD, 1501-CE, 1501-CF, 1501-CG, 1501-CH, 1501-CI, 1501-CJ, 1501-CL, 1501-CM, 1501-CN, 1501-CO, 1501-CP, 1501-CQ, 1501-CR, 1501-CS, 1501-CT, 1501-CU, 1501-CV, 1501-CW, 1501-CX, 1501-CY, 1501-CZ, 1501-DA, 1501-DB, 1501-DC, 1501-DD, 1501-DE, 1501-DF, 1501-DG, 1501-DH, 1501-DI, 1501-DJ, 1501-DM, 1501-DN, 1501-DO, 1501-DP, 1501-DQ, 1501-DR, 1501-DS, 1501-DT, 1501-DU, 1501-DV, 1501-DW, 1501-DX, 1501-DY, 1501-DZ, 1501-EA, 1501-EB, 1501-EC, 1501-ED, 1501-EE, 1501-EF, 1501-EG, 1501-EH, 1501-EI, 1501-EJ, 1501-EL, 1501-EM, 1501-EN, 1501-EO, 1501-EP, 1501-EQ, 1501-ER, 1501-ES, 1501-ET, 1501-EU, 1501-EV, 1501-EW, 1501-EX, 1501-EY, 1501-EZ, 1501-FA, 1501-FB, 1501-FC, 1501-FD, 1501-FE, 1501-FF, 1501-FG, 1501-FH, 1501-FI, 1501-FJ, 1501-FL, 1501-FM, 1501-FN, 1501-FO, 1501-FP, 1501-FQ, 1501-FR, 1501-FS, 1501-FT, 1501-FU, 1501-FV, 1501-FW, 1501-FX, 1501-FY, 1501-FZ, 1501-GA, 1501-GB, 1501-GC, 1501-GD, 1501-GE, 1501-GF, 1501-GG, 1501-GH, 1501-GI, 1501-GJ, 1501-GL, 1501-GM, 1501-GN, 1501-GO, 1501-GP, 1501-GQ, 1501-GR, 1501-GS, 1501-GT, 1501-GU, 1501-GV, 1501-GW, 1501-GX, 1501-GY, 1501-GZ, 1501-HA, 1501-HB, 1501-HC, 1501-HD, 1501-HE, 1501-HF, 1501-HG, 1501-HH, 1501-HI, 1501-HJ, 1501-HL, 1501-HM, 1501-HN, 1501-HO, 1501-HP, 1501-HQ, 1501-HR, 1501-HS, 1501-HT, 1501-HU, 1501-HV, 1501-HW, 1501-HX, 1501-HY, 1501-HZ, 1501-IA, 1501-IB, 1501-IC, 1501-ID, 1501-IE, 1501-IF, 1501-IG, 1501-IH, 1501-II, 1501-IL, 1501-IM, 1501-IN, 1501-IO, 1501-IP, 1501-IQ, 1501-IR, 1501-IS, 1501-IT, 1501-IU, 1501-IV, 1501-IW, 1501-IX, 1501-IY, 1501-IZ, 1501-JA, 1501-JB, 1501-JC, 1501-JD, 1501-JE, 1501-JF, 1501-JG, 1501-JH, 1501-JI, 1501-JJ, 1501-JL, 1501-JM, 1501-JN, 1501-JO, 1501-JP, 1501-JQ, 1501-JR, 1501-JS, 1501-JT, 1501-JU, 1501-JV, 1501-JW, 1501-JX, 1501-JY, 1501-JZ, 1501-KA, 1501-KB, 1501-KC, 1501-KD, 1501-KE, 1501-KF, 1501-KG, 1501-KH, 1501-KI, 1501-KJ, 1501-KL, 1501-KM, 1501-KN, 1501-KO, 1501-KP, 1501-KQ, 1501-KR, 1501-KS, 1501-KT, 1501-KU, 1501-KV, 1501-KW, 1501-KX, 1501-KY, 1501-KZ, 1501-LA, 1501-LB, 1501-LC, 1501-LD, 1501-LE, 1501-LF, 1501-LG, 1501-LH, 1501-LI, 1501-LJ, 1501-LK, 1501-LM, 1501-LN, 1501-LO, 1501-LP, 1501-LQ, 1501-LR, 1501-LS, 1501-LT, 1501-LU, 1501-LV, 1501-LW, 1501-LX, 1501-LY, 1501-LZ, 1501-MA, 1501-MB, 1501-MC, 1501-MD, 1501-ME, 1501-MF, 1501-MG, 1501-MH, 1501-MI, 1501-MJ, 1501-ML, 1501-MN, 1501-MO, 1501-MP, 1501-MQ, 1501-MR, 1501-MS, 1501-MT, 1501-MU, 1501-MV, 1501-MW, 1501-MX, 1501-MY, 1501-MZ, 1501-NA, 1501-NB, 1501-NC, 1501-ND, 1501-NE, 1501-NF, 1501-NG, 1501-NH, 1501-NI, 1501-NJ, 1501-NL, 1501-NM, 1501-NO, 1501-NP, 1501-NQ, 1501-NR, 1501-NS, 1501-NT, 1501-NU, 1501-NV, 1501-NW, 1501-NX, 1501-NY, 1501-NZ, 1501-OA, 1501-OB, 1501-OC, 1501-OD, 1501-OE, 1501-OF, 1501-OG, 1501-OH, 1501-OI, 1501-OJ, 1501-OL, 1501-OM, 1501-ON, 1501-OO, 1501-OP, 1501-OQ, 1501-OR, 1501-OS, 1501-OT, 1501-OU, 1501-OV, 1501-OW, 1501-OX, 1501-OY, 1501-OZ, 1501-PA, 1501-PB, 1501-PC, 1501-PD, 1501-PE, 1501-PF, 1501-PG, 1501-PH, 1501-PI, 1501-PJ, 1501-PL, 1501-PM, 1501-PN, 1501-PO, 1501-PP, 1501-PQ, 1501-PR, 1501-PS, 1501-PT, 1501-PU, 1501-PV, 1501-PW, 1501-PX, 1501-PY, 1501-PZ, 1501-QA, 1501-QB, 1501-QC, 1501-QD, 1501-QE, 1501-QF, 1501-QG, 1501-QH, 1501-QI, 1501-QJ, 1501-QL, 1501-QM, 1501-QN, 1501-QO, 1501-QP, 1501-QQ, 1501-QR, 1501-QS, 1501-QT, 1501-QU, 1501-QV, 1501-QW, 1501-QX, 1501-QY, 1501-QZ, 1501-RA, 1501-RB, 1501-RC, 1501-RD, 1501-RE, 1501-RF, 1501-RG, 1501-RH, 1501-RI, 1501-RJ, 1501-RL, 1501-RM, 1501-RN, 1501-RO, 1501-RP, 1501-RQ, 1501-RR, 1501-RS, 1501-RT, 1501-RU, 1501-RV, 1501-RW, 1501-RX, 1501-RY, 1501-RZ, 1501-SA, 1501-SB, 1501-SC, 1501-SD, 1501-SE, 1501-SF, 1501-SG, 1501-SH, 1501-SI, 1501-SJ, 1501-SL, 1501-SM, 1501-SN, 1501-SO, 1501-SP, 1501-SQ, 1501-SR, 1501-SS, 1501-ST, 1501-SU, 1501-SV, 1501-SW, 1501-SX, 1501-SY, 1501-SZ, 1501-TA, 1501-TB, 1501-TC, 1501-TD, 1501-TE, 1501-TF, 1501-TG, 1501-TH, 1501-TI, 1501-TJ, 1501-TL, 1501-TM, 1501-TN, 1501-TO, 1501-TP, 1501-TQ, 1501-TR, 1501-TS, 1501-TT, 1501-TU, 1501-TV, 1501-TW, 1501-TX, 1501-TY, 1501-TZ, 1501-UA, 1501-UB, 1501-UC, 1501-UD, 1501-UE, 1501-UF, 1501-UG, 1501-UH, 1501-UI, 1501-UJ, 1501-UL, 1501-UM, 1501-UN, 1501-UO, 1501-UP, 1501-UQ, 1501-UR, 1501-US, 1501-UT, 1501-UV, 1501-UW, 1501-UX, 1501-UY, 1501-UZ, 1501-VA, 1501-VB, 1501-VC, 1501-VD, 1501-VE, 1501-VF, 1501-VG, 1501-VH, 1501-VI, 1501-VJ, 1501-VL, 1501-VM, 1501-VN, 1501-VO, 1501-VP, 1501-VQ, 1501-VR, 1501-VS, 1501-VT, 1501-VU, 1501-VV, 1501-VW, 1501-VX, 1501-VY, 1501-VZ, 1501-WA, 1501-WB, 1501-WC, 1501-WD, 1501-WE, 1501-WF, 1501-WG, 1501-WH, 1501-WI, 1501-WJ, 1501-WL, 1501-WM, 1501-WN, 1501-WO, 1501-WP, 1501-WQ, 1501-WR, 1501-WS, 1501-WT, 1501-WU, 1501-WV, 1501-WX, 1501-WY, 1501-WZ, 1501-XA, 1501-XB, 1501-XC, 1501-XD, 1501-XE, 1501-XF, 1501-XG, 1501-XH, 1501-XI, 1501-XJ, 1501-XL, 1501-XM, 1501-XN, 1501-XO, 1501-XP, 1501-XQ, 1501-XR, 1501-XS, 1501-XT, 1501-XU, 1501-XV, 1501-XW, 1501-XX, 1501-XY, 1501-XZ, 1501-YA, 1501-YB, 1501-YC, 1501-YD, 1501-YE, 1501-YF, 1501-YG, 1501-YH, 1501-YI, 1501-YJ, 1501-YL, 1501-YM, 1501-YN, 1501-YO, 1501-YP, 1501-YQ, 1501-YR, 1501-YS, 1501-YT, 1501-YU, 1501-YV, 1501-YW, 1501-YX, 1501-YY, 1501-YZ, 1501-ZA, 1501-ZB, 1501-ZC, 1501-ZD, 1501-ZE, 1501-ZF, 1501-ZG, 1501-ZH, 1501-ZI, 1501-ZJ, 1501-ZL, 1501-ZM, 1501-ZN, 1501-ZO, 1501-ZP, 1501-ZQ, 1501-ZR, 1501-ZS, 1501-ZT, 1501-ZU, 1501-ZV, 1501-ZW, 1501-ZX, 1501-ZY, 1501-ZZ, 1501-AA, 1501-AB, 1501-AC, 1501-AD, 1501-AE, 1501-AF, 1501-AG, 1501-AH, 1501-AI, 1501-AJ, 1501-AL, 1501-AM, 1501-AN, 1501-AO, 1501-AP, 1501-AQ, 1501-AR, 1501-AS, 1501-AT, 1501-AU, 1501-AV, 1501-AW, 1501-AX, 1501-AY, 1501-AZ, 1501-BA, 1501-BB, 1501-BC, 1501-BD, 1501-BE, 1501-BF, 1501-BG, 1501-BH, 1501-BI, 1501-BJ, 1501-BL, 1501-BM, 1501-BN, 1501-BO, 1501-BP, 1501-BQ, 1501-BR, 1501-BS, 1501-BT, 1501-BU, 1501-BV, 1501-BW, 1501-BX, 1501-BY, 1501-BZ, 1501-CA, 1501-CC, 1501-CD, 1501-CE, 1501-CF, 1501-CG, 1501-CH, 1501-CI, 1501-CJ, 1501-CL, 1501-CM, 1501-CN, 1501-CO, 1501-CP, 1501-CQ, 1501-CR, 1501-CS, 1501-CT, 1501-CU, 1501-CV, 1501-CW, 1501-CX, 1501-CY, 1501-CZ, 1501-DA, 1501-DB, 1501-DC, 1501-DD, 1501-DE, 1501-DF, 1501-DG, 1501-DH, 1501-DI, 1501-DJ, 1501-DM, 1501-DN, 1501-DO, 1501-DP, 1501-DQ, 1501-DR, 1501-DS, 1501-DT, 1501-DU, 1501-DV, 1501-DW, 1501-DX, 1501-DY, 1501-DZ, 1501-EA, 1501-EB, 1501-EC, 1501-ED, 1501-EE, 1501-EF, 1501-EG, 1501-EH, 1501-EI, 1501-EJ, 1501-EL, 1501-EM, 1501-EN, 1501-EO, 1501-EP, 1501-EQ, 1501-ER, 1501-ES, 1501-ET, 1501-EU, 1501-EV, 1501-EW, 1501-EX, 1501-EY, 1501-EZ, 1501-FA, 1501-FB, 1501-FC, 1501-FD, 1501-FE, 1501-FF, 1501-FG, 1501-FH, 1501-FI, 1501-FJ, 1501-FL, 1501-FM, 1501-FN, 1501-FO, 1501-FP, 1501-FQ, 1501-FR, 1501-FS, 1501-FT, 1501-FU, 1501-FV, 1501-FW, 1501-FX, 1501-FY, 1501-FZ, 1501-GA, 1501-GB, 1501-GC, 1501-GD, 1501-GE, 1501-GF, 1501-GG, 1501-GH, 1501-GI, 1501-GJ, 1501-GL, 1501-GM, 1501-GN, 1501-GO, 1501-GP, 1501-GQ, 1501-GR, 1501-GS, 1501-GT, 1501-GU, 1501-GV, 1501-GW, 1501-GX, 1501-GY, 1501-GZ, 1501-HA, 1501-HB, 1501-HC, 1501-HD, 1501-HE, 1501-HF, 1501-HG, 1501-HH, 1501-HI, 1501-HJ, 1501-HL, 1501-HM, 1501-HN, 1501-HO, 1501-HP, 1501-HQ, 1501-HR, 1501-HS, 1501-HT, 1501-HU, 1501-HV, 1501-HW, 1501-HX, 1501-HY, 1501-HZ, 1501-IA, 1501-IB, 1501-IC, 1501-ID, 1501-IE, 1501-IF, 1501-IG, 1501-IH, 1501-II, 1501-IJ, 1501-IL, 1501-IM, 1501-IN, 1501-IO, 1501-IP, 1501-IQ, 1501-IR, 1501-IS, 1501-IT, 1501-IU, 1501-IV, 1501-IW, 1501-IX, 1501-IY, 1501-IZ, 1501-JA, 1501-JB, 1501-JC, 1501-JD, 1501-JE, 1501-JF, 1501-JG, 1501-JH, 1501-JI, 1501-JJ, 1501-JL, 1501-JM, 1501-JN, 1501-JO, 1501-JP, 1501-JQ, 1501-JR, 1501-JS, 1501-JT, 1501-JU, 1501-JV, 1501-JW, 1501-JX, 1501-JY, 1501-JZ, 1501-KA, 1501-KB, 1501-KC, 1501-KD, 1501-KE, 1501-KF, 1501-KG, 1501-KH, 1501-KI, 1501-KJ, 1501-KL, 1501-KM, 1501-KN, 1501-KO, 1501-KP, 1501-KQ, 1501-KR, 1501-KS, 1501-KT, 1501-KU, 1501-KV, 1501-KW, 1501-KX, 1501-KY, 1501-KZ, 1501-LA, 1501-LB, 1501-LC, 1501-LD, 1501-LE, 1501-LF, 1501-LG

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

TexCom

WE BUY • SELL • LEASE

FROM THE MANY FORTUNE 500 COMPANIES THAT UTILIZE IBM EQUIPMENT FROM TEXCOM... THE IBM SPECIALISTS

SERIES I

- All features and peripherals
- We buy, sell or trade
- Convenient lease available

1331 1311 • 1361 1381

- We buy, sell or lease
- Two, three, four year leases

WE'VE GOT IBM PERIPHERALS

3803	3380	3350	3211
3420	3880	3370	3811
3375	3340	3203	3262

IBM S 31 - 36 - 38

- All upgrades available now
- One, two, three year leases
- We'll take S/34 trade-ins
- All models and peripherals

WE'VE GOT ALL IBM PRINTERS
AND TERMINALS
PLUS 3864 MODEMS NOW.

FOR SALE OR LEASE

IBM PC-XT'S
256K, COLOR MONITOR
AND GRAPHICS PRINTER.

Call Toll Free: 1-800-833-9119

SAH ANTONIO (512) 549-9958
MEMPHIS (901) 756-7055
HOUSTON (713) 890-8714



PICK A CARD ... ANY CARD

and call
(703)
642-1950

we're ready
to deal.



CARLYN

COMPUTER SYSTEMS

51050 BACKLICK ROAD, ANNANDALE, VA 22003

We Buy & Sell

DEC

Systems Components

digital
computer
lease

call 713
448-0982

1400 Avenue B, Suite 100
Houston, TX 77058

IN STOCK
Fujitsu Eagle

with color, color, color
at \$1,200

New Fujitsu SP 380
80 character per second,
letter quality printer.
Inexpensive! Special - \$1,500

MANDRE
MARKET INC.

303-883-3035

2771 S. Jasper • Aurora, CO 80013

Your Texas Computer Connection



Computer equipment at big savings.
Everything from PC's to Mainframes.

214/258-0541



Metroplex Computer Company, Inc.

328 Decker Drive, Suite 100 • Irving, Texas 75038 • TX-9774

DSI

WE BUY
SELL &
LEASE!

BURROUGHS

Discover the
DSI alternative.

800-641-5215

All equipment available
immediately and guaranteed
for Burroughs Maintenance

DSI is serving the Burroughs
Community Worldwide
3000 W. Alameda, Denver CO
80233 (303) 422-8331
TWX 710 131 5863

DEC
New and Used
in Stock

COMPUTERS

Rainbow 100
DECmate 11 and II
Pro 350

Micro 11
WD 211
11/23 +
11/24
11/44

CRTS

VT101-AA VT102-AA
VT103-AA VT105-AA

PRINTERS

LA 34

LA 100

LOPSE

Command Data
PHONE 205/942-3156



Command Data International
100 West Valley Avenue
Suite 105
Birmingham, Alabama 35202

ATTENTION TO DETAIL
All of Our IBM Equipment is
Tested/Audited/Refurbished

WANTED

SERIES I

Immediate Cash

Buy/Sell/Lease

X

XERXES
COMPUTER
SALES

1111 Harmon Place
Hingham, MA 01903
800-328-3884, 617-339-0842

FOR SALE

1 System Technology RT-720
Graphics System consisting of: 1 DEC
PDP 11/70 Processor, 2 DEC Health
Care Drivers, 1 DEC Data Converter
Console, 1 DEC RT16 Trace Drive, 1
8001 Plot Printer, 2 Realtime Systems
ware CRT's, 4 Graphics Workstations,
Graphics Model (GIM) Model 1, 1 Host
Copy Link Transducer Model 6801.

For Information Contact:
Bentley Shaw
Control Times Inc. Works
P.O. Box 840
Waco, TX 76798-0840
(817) 776-8888

3270

There's No Time For DOWNTIME!

So while the industry works on your system's problems, let us work on your business problems. Advertise in—

COMPUTERWORLD CLASSIFIEDS!

One insertion will let a potential audience of over a half a million readers know what you are looking for or have to offer. Whether you are looking to recruit computer professionals, want to buy, sell or lease equipment, have computer time or services to offer, or software packages to sell, and more, Computerworld Classifieds will help you get a lot of exposure and get things done faster.

The open line rate is \$9.15 per line and there is a minimum size of 1 column by 2" at a cost of \$258.20. We can accommodate up to 5 columns and depth measurement increases by half inch increments.

Ads may be mailed in, clearly typewritten, with a letter stating the size desired and the issue in which it is to be run. Our adtakers will take ads that require no artwork or borders over the phone. We also provide telecopier service.

Any borders, logos, or artwork should be sent in with your ad and must be dark and clear enough to be reproduced.

Computerworld comes out every Monday and our deadline for receiving ads is 10 days (or six working days) prior to the issue date desired.

First time advertisers must send either payment or a purchase order along with their first ad.

Our mailing address is:

Classified Advertising
Computerworld

Box 880, 375 Cochituate Road
Framingham, MA 01701

800 343-8474; (617) 878-0700

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

FOR DEC CALL
LET'S GET GRAPHIC

VT125-AA VT100
w/Graphica
\$2,745.

VT1XX-CB VT125 KI
\$1,455.

VT240's w/Country KI
\$1,650.

WE CAN DELIVER NOW!

SCHERERS

P.S.: VT100-AA
now \$1,295.

816 SCHERERS PLACE
DUBLIN, OHIO 43017
(614) 899-0810

NPA

"Log on with NPA, we cover all your DG computer needs from

Systems Inc.

SPECIALIZING IN:
PURCHASE, SALE, TRADE,
LEASE, RENT
AND SERVICE OF

Data General
EQUIPMENT



Millions of dollars in DG equipment ready for overnight shipment from other areas.

NEW YORK: 616-467-2900 CALIFORNIA REPRESENTATIVE: 415-630-8363

TEPA

1000 UNIVERSITY AVENUE, SUITE 100, NEW YORK, NY 10017

1000 UNIVERSITY AVENUE, SUITE 100, NEW YORK, NY 10017



BUY — SELL — LEASE

SYS/34 SYS/36

- IMMEDIATE DELIVERY
- GUARANTEED IN/A
- SHORT TERM RENTALS
- PERIPHERALS
- FEATURES-UPGRADES

MARION

64 HENNING STREET
NACKERACK, N. J. 07642



(201) 343-4554
(203) 758-2409
(412) 864-8811



Net COMPUTER LEASING CO.
IN EUROPE with 2000 IBM CPU
Installed is now serving you in
the United States.

ECS has available:
3081 K34/36 mid cap: 74%
3081 K14/16 mid cap: 88%
Call: Alan MATHEWITSCH
203 226 3721 Westport CT

IBM
AT A
SAVINGS!

SYSTEM
34
SYSTEM
38

SYSTEM
36

Contact Datacomp
and find out how much
you can save...

Call toll free
800/323-3289

**datacomp leasing
& service group**

Lease
Plans

Compare
before you
Lease

Chicago 312/323-3289
New York 201/687-8888
Los Angeles 714/871-8911

■ 3 A-1 Dun & Bradstreet
rating ■ 2500 satisfied
customers ■ staff know-
ledgeable professionals
■ Satisfaction Guaranteed

**SYSTEM/34
SYSTEM/36
SYSTEM/38
SERIES/1**

ECONOCOM
• BUYS • SELLS
• LEASES

- QUICK DELIVERY
- COMPETITIVE PRICING
- FLEXIBLE FINANCING
- TRAIL-BLIND ACCEPTED
- PROFESSIONAL SERVICE
- SHORT-TERM LEASING
- LONG-TERM LEASING
- PERMANENT LEASING
- TAKE-OUTS DONE
- MAINTENANCE GUARANTEE
- NEW OR USED

FIND IT FAST IN OUR FAMOUS
COMPUTER MARKET ADVISOR
SEND US YOUR BUSINESS CARD
AND WE WILL SEND YOU A FREE COPY.

ECONOCOM COMPUTER SALES, INC.
810 CROSSOVER LANE • P.O. BOX 10007 • MEMPHIS, TENNESSEE 38101 • 901-767-9120

800-238-3098

**4331 AVAILABLE NOW
SALE OR LEASE**

Also ALL PERIPHERALS

Purchased, Sold & Leasing



**CORPORATE
COMPUTERS, INC.**

Contact:
Norm Burger

(203) 661-1500

115 Mason St., Greenwich, Conn. 06830

Member Computer Dealers & Leasing Association

BUY SELL SWAP

BUY SELL SWAP

BUY SELL SWAP

*The nationwide market - a call away!***DEC/DG****SYSTEMS/PARTS/PERIPHERALS
NEW/USED/SURPLUS • DISCOUNT PRICES***Since 1977! Buy, Sell, Trade and Broker.***PHIL****BRYAN****JENNIFER****DC****11-VAX****8-LSI****CALL TODAY - (305) 392-2005****TELEX 568-670****thomas business systems, inc.**

4501 Oak Circle • Unit 11 Boca Raton, Florida 33431

ceres announces**3370s****immediately available****A02s & B02s****A12s & B12s****Houston****New York****(713) 627-7117 (212) 279-4467****PEARL HAS
IBM SYSTEMS
34, 36, 38**

and we have a large inventory of IBM 3741's, CPU's, CRT's and printers. We buy, sell, lease, rent and purchase/leaseback IBM Systems.

**Pearl Computer Division**Call John Spight or Ken Warren
4100 Box 24224 • 4217 Centennial Blvd.
Nashville, TN 37202 (615) 383-8703**BIDS &
PROPOSALS****ATTENTION:
COMPUTER SOFTWARE CONSULTANTS**

The Human Resources Administration/Department of Social Services is seeking proposals for the design, development and implementation of an automated information and Referral/Vocancy Control System for HRA's Agency for Child Development.

Request for Proposals may be obtained beginning 9:00 A.M. on Monday, April 30, 1984 until 5:00 P.M. on Friday, May 4, 1984 from the Office of Management Design at 60 Hudson Street, 15th Floor, New York, NY 10013. Attention: Richard C. Silverman, Jr. (212) 405-4222.

A Proposer's Conference will be held at 10:00 A.M. on Monday, May 7, 1984 at 100 Canal Street, 15th Floor, New York, NY.

Proposals will be received by the Human Resources Administration/Department of Social Services until 5:00 P.M., Monday, June 18, 1984.

Want to Buy

5291, 5251, 5256**Detective Planner
Boards****\$100 each**

For Details Call

(818) 882-9141

Russell Sullivan

Computech**REAL ESTATE****For Sale:
Data Center —
Indianapolis**

A complete, fully-facilitated Data Center ready for immediate occupancy. The 13,800 square foot building (9,700 square feet, raised floor) has diesel generators, UPS, base vault and more.

Located in a prime industrial park, just 5 minutes from the Indianapolis airport. Please send inquiries to or call:

Director of Facilities
PAC Corporation
P.O. Box 410427
Dallas, Texas 75247
(214) 888-7400**FMC**

(Private Only)

COMPUTERWORLD CLASSIFIEDS—**—PROGRAMMED TO HELP YOU.**The computer industry is dedicated to developing greater efficiency and valuable time-saving resources for the business world. Well, so are **Computerworld Classifieds**.

And we can deal with a lot of problems. Our classifications include:

Position Announcements — To help you find the computer professionals right for you.**Positions Wanted** — For individuals seeking full-time, permanent positions - no company ads are allowed.**Buy, Sell, Swap** — For those seeking to buy, sell or lease computer equipment.**Time & Services** — For companies who want to offer computer timesharing or other computer-related services.**Software for Sale & Software Wanted** — Used for buying & selling software packages.**Business Opportunities** — For those seeking individuals or partners in computer-related business ventures, mergers, or franchises.**Real Estate** — For those seeking to sell or lease office space suitable for computer rooms or computerized businesses.**Bids & Proposals** — Used to request for bids on equipment or to invite proposals for desired computer acquisitions.**The Computerworld Bulletin Board** — This is a low-cost way to buy or sell individual pieces of hardware or software. See below for details on sizes and cost.

The deadline for classified advertising is ten days prior to the issue desired. (That's six working days prior to the issue date.) Ads may be sent in by mail. For camera-ready ads, a vector or negative is required. For ads to be typeset by us, enclose a layout if needed, along with any logos or artwork you would like to include in the ad. These must be dark and clear for reproduction purposes.

Our ad takers will be happy to take smaller sized ads over the phone. We can provide simple line borders for you, if desired.

The open line rate is \$9.15 per line and there is a minimum size ad of 2 column inches (28 lines) at a cost of \$256.20. Column inches are calculated by multiplying the number of columns wide by the number of inches deep that your ad is. Depth increases in half-inch increments and we accommodate up to 5 columns.

If you wish a box number to be assigned to your ad, it will cost an additional \$15.00.

For the **Computerworld Bulletin Board**, ads may be sent by mail, by telecopier or given over the phone. Space is available in **one column by one inch deep** units only. They are set up using a **simple format with standard typewritten, and no borders or logos are allowed**. The cost of one standard unit is \$130.00. These units may be combined to form deeper ads.

If you wish to reserve space, or would like more information, call us at 1-800-343-6474 or (in Mass.) 617-879-0700. All materials should be sent to:

**COMPUTERWORLD Classifieds
Box 896, Framingham, MA 01701**

IF YOU WANT THE BEST APPLICATIONS DEVELOPMENT TOOL, TALK TO THE PEOPLE WHO DEVELOP THE BEST APPLICATIONS.

Of all the applications development tools ever designed, only one has the proven success of our new Millennium SDT.

Because Millennium SDT was designed by McCormack & Dodge, a company with over a decade of proven success developing applications. Business applications used in over thirty countries. By the world's biggest and most demanding corporate clients.

M & D design teams have developed everything from accounts payable to payroll/personnel software. Recently, they've won industry acclaim for developing the only family of systems on the market with a genuinely borderless environment. The Millennium series.

What made the Millennium series possible was our discovery of Millennium SDT, a remarkable tool based on a remarkable truth: eighty percent of the functions in all applications are, in fact, generic. Which means that 80% are reusable.

This discovery allowed us to vastly simplify and accelerate our entire systems development process. Tasks that once took months suddenly took days. And we were able to bring a breakthrough product line to the marketplace well ahead of our competition.

If Millennium SDT revolutionized our systems development process, think of what it can do for yours. You'll make more efficient use of your data processing resources than you ever thought possible.

And just to give you an idea of how fast our applications development tool works, we've included your first application in this ad. All you do is find the dotted lines, fill in the requested information, mail the completed form, and wait for the postman to bring a packet of important information. And, if you're in a real hurry, call 1-800-343-0325.

Soon your backlog will begin to disappear. You'll be a Millennium ahead.

START WITH THIS APPLICATION.

Name and Title _____

Company _____

Address _____

City _____

State _____

Zip _____

IBM Mainframe Model _____

WHEN YOU THINK ABOUT TOMORROW, MILLENNIUM MAKES SENSE TODAY.

McCormack & Dodge

a company of
The Data & Translation Corporation

McCormack & Dodge Corporation, 1225 Worcester Road, Natick, MA 01760

Sales and support offices throughout North and South America, Europe, Asia, Australia and Africa. 800-343-0325. Telex: 710-325-0329